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J. C. Russell

A TEXT-BOOK OF THE PRACTICE OF MEDICINE

BY


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etc., etc.

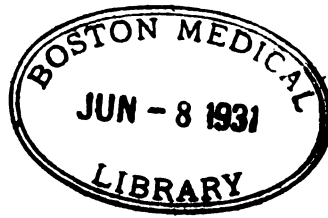
Including a Section on DISEASES OF THE NERVOUS SYSTEM

BY

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1902



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TO THE MEMORY
of those of
The "Old Guard"
of the
American Institute of Homoeopathy

WHO HAVE PASSED AWAY ;

Whose forms and faces we remember, whose memories we cherish,
whose labors for the truth have reared for them
an imperishable monument,
this volume
is lovingly dedicated
by the
AUTHOR.

PREFACE.

IN the preparation of the material for this volume I have endeavored to embody the very latest known ideas as to the pathology, etiology, diagnosis and treatment of disease. To this end I have extensively gleaned from modern medical literature, and have not hesitated to quote from well-known, eminent medical authorities. This is especially the case as regards bacteriology, though I do not fully accept the conclusions of modern bacteriologists as final. In these days the sciences collateral to medicine are progressing too rapidly for us to conclude that final and absolute truth has already been reached. In making quotations I have endeavored to give, in each instance, full credit for the same. I especially acknowledge my indebtedness to William Osler, M. D., and James M. Anders, M. D.; to the latter more particularly for his kind permission to use many of the diagnostic tables appearing in his recent work on the Practice of Medicine, and which I consider one of the most attractive features of Dr. Anders's valuable book.

In giving the treatment of diseases I have been largely governed by my own somewhat extended experience, now covering nearly a third of a century. In matters connected with the general management, especially as regards diet, it has been impossible to avoid mentioning various preparations now upon the market, and the use of which is desirable, even though their mention may appear to savor of commercialism. In so far as possible, the names of the manufacturers have been omitted.

At the solicitation of the publishers and a few professional friends and medical students, I have, contrary to my own inclinations, indicated the strength of medicines as I usually employ them in the various diseases mentioned. It must be remembered, however, that the strength of a medicine used in a given case of disease is, and must always be, a matter of individual opinion and judgment. Many think they obtain better results by using the higher and even the highest potencies, while others feel the necessity of using more material doses. A homœopathic prescription, in order to be such, does not depend upon the potency or material strength of the medicine prescribed, but upon the application of that medicine to the case in hand in accordance with the law of similars. Hahnemann advised to give the smallest dose

possible necessary to effect a cure, but each prescriber must judge for himself as to how small or how large a dose the necessity demands.

While I yield to no one in my devotion to the principles of homœopathy, nevertheless, I firmly believe in the use, when indicated, of mechanical means and sometimes of palliative measures in the treatment of certain conditions. Not that these should be abused, as they often are, or made to supplant homœopathic therapeutics, but rather that they be made subservient thereto as necessary and valuable adjuvants. To have omitted the suggestion of such measures, when, in my judgment, their use may be required, would have deprived this book of its practical character — my chiefest aim in its preparation.

I desire to acknowledge in the fullest manner possible the value of Professor Delamater's services in preparing the section on Diseases of the Nervous System. He has brought to this labor, as an eminent neurologist, a profound knowledge and a ripe experience, without which it would have been practically impossible for me to have successfully presented these often obscure and difficult subjects in a practical and scientific manner.

My thanks are due to Prof. W. M. Stearns, M. D., and Prof. Chas. Gatchell, M. D., for valuable suggestions in their respective specialties, covering diseases of the nose, throat and lungs.

A. C. COWPERTHWAIT.

Chicago, Sept. 20, 1901.

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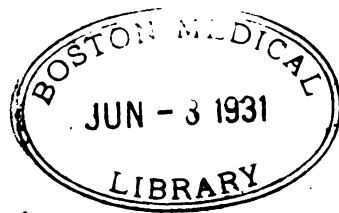
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SECTION I.

DISEASES OF THE DIGESTIVE SYSTEM.

I. DISEASES OF THE MOUTH.

STOMATITIS.

Definition.—Inflammation of the mouth.

Varieties.—(1) Catarrhal, (2) Aphthous, (3) Membranous, (4) Ulcerative, (5) Parasitic (Thrush), (6) Gangrenous, (7) Mercurial.

CATARRHAL STOMATITIS.

Synonyms.—Simple Stomatitis, Erythematous Stomatitis, Catarrh of the mouth.

Definition.—A simple acute inflammation of the whole or a portion of the mucous membrane of the mouth and tongue. Most common in infants and children.

Etiology.—It most often results from some irritation in the mouth, mechanical or chemical, such as too hot or too cold food or drink, acids, condiments, tobacco, irritating drugs, sharp bodies, eruption of the teeth, etc.

It may also occur from bad feeding, especially in ill-nourished, unhealthy constitutions, and particularly those under the influence of generally bad hygienic influences. In adults it more often arises from the overuse of tobacco, or from too hot or too highly seasoned foods, and from a neglect of the mouth toilet.

Catarrhal Stomatitis may be dependent on gastro-intestinal disorders, and often results from prolonged diarrhoea, especially so when the stools have an acid reaction. It is frequently associated with low forms of eruptive diseases, particularly scarlet fever, measles, variola and typhoid, and may occur by an extension of an ulcerative tonsillitis or pharyngitis.

Symptoms.—The inflammation may be limited to the gums and lips, or may involve more or less of the entire buccal mucous membrane including the tongue. The parts become red, hot, dry and swollen, the

tongue furred and showing the impression of the teeth. There is much burning, smarting and tension. The infant refuses to nurse, or after one or two attempts lets go the nipple and begins to cry. There is nearly always present a craving for cold drinks. The dryness is soon succeeded by an increased secretion, and later small vesicles appear on the projecting follicles, which may terminate in superficial erosions and simple ulcers.

Constitutional disturbances are but slight, but sometimes we may find slight fever, restlessness and sleeplessness.

The taste is perverted or entirely wanting, there being usually an unpleasant, bitter, foul taste. The disease usually lasts about one week, except when dependent upon the presence of other disease in the system, which may also intensify the constitutional disturbances.

Diagnosis.—The disease is readily determined by the local conditions.

Prognosis.—The prognosis is favorable in simple acute cases, but in those associated with other diseases, much depends upon the character of the complications, and in all cases where a known cause exists, it must be overcome before recovery takes place.

Treatment.—If possible, the cause must be discovered and removed. Usually it is necessary to improve the non-hygienic surroundings, and often to remove obvious irritant influences. The mouth should be frequently bathed with cold water, or as Raue suggests, cold wine and water. A solution of borax may be used one drachm to the ounce of water; or, a mixture of borax, one drachm to the ounce of glycerine and water; or, as Tooker recommends, one part of borax to three of honey. Dickinson recommends ten drops of muriatic acid in two ounces of water. In very severe cases a solution of nitrate of silver, two grains to the ounce is recommended. The above to be applied by means of a soft linen cloth tied to a stick or wrapped around the finger. Most authors suggest that no internal remedy is required; but I would advise the administration of *Merc. sol.* 3x in most cases.—chlorate of potash is homœopathic to all forms of stomatitis.

APHTHOUS STOMATITIS.

Synonyms.—Follicular stomatitis, Vesicular stomatitis.

Definition.—A variety of catarrhal stomatitis characterized by an acute inflammation of the follicles and mucous membrane of the mouth and tongue, resulting in an exudation which first appears in isolated spots (*aphthæ discrete*) forming slightly raised vesicles surrounded by yellowish white bases, and bright red edges; these afterward coalesce into large and irregular-sized patches (*aphthæ confluent*) which rupture

and leave an ulcer, which slowly heals. Coalescence does not occur in all cases, the vesicles remaining clearly isolated.

Etiology.—The disease is more common in childhood, usually under three years of age, but frequently attacks older children and adults. It arises from disorders of digestion, especially in children suffering from difficult dentition and in tuberculous and anemic subjects. It may also occur in the course of acute eruptive diseases.

Symptoms.—There first appears a redness of the mucous membrane, soon followed by the isolated vesicles, usually from six to twenty in number, situated on the inside of the lips and cheeks, along the edges of the tongue, on the gums, and sometimes the roof of the mouth. They are exquisitely painful, the infant refusing to nurse and older children can scarcely masticate or swallow food, or talk.

Salivation is quite marked and the breath is fetid. In children, especially, there is more or less fever, restlessness and sleeplessness. The digestion is impaired and quite often diarrhœa occurs; the urine being generally scanty and high-colored.

Other constitutional symptoms are usually due to the disease with which the individual case may be associated.

Diagnosis.—The disease must not be confounded with Thrush (see table, page 21), or herpetic eruptions, though by some the latter are considered identical. The characteristic appearance of the ulcers and the exquisite soreness and pain usually render the diagnosis easy.

Prognosis.—The prognosis is good. The disease generally lasts from four to seven days, but much depends upon the constitution of the patient, as successive crops may result from ill nourishment or bad treatment, and thus the case be prolonged. The confluent form is most difficult to manage. In severe cases the fauces and pharynx may become involved and irritating ulcers form which heal with difficulty.

Treatment.—All irritating influences should be removed and absolute cleanliness maintained. The mouth should be frequently rinsed with a three-per-cent solution of boric acid, or instead borolyptol, listerine or some similar preparation may be used. Absolute cleanliness both of the vehicles of administration and the food is very important, especially in the case of bottle-fed babies. A weak wash of chlorate of potash or borax and glycerine may be used. Arndt has found the best results from the use of the fluid extract of *Coptis trifolia* (gold thread) from forty to sixty drops to the ounce of water. Hydrastis is often useful. The internal remedy will depend largely upon the nature of the general symptoms that may be present in the individual case. Most often *Merc. sol.* (3x) is required, but the symptoms may demand another remedy. *Kali chlor* produces an aphthous condition of the

mucous membranes, and is homœopathic to all such conditions. It is especially called for where there is great fetor, tough stringy saliva, mucous membrane red and swollen, grayish ulcers. A solution equivalent to about the second decimal dilution is usually employed.

Borax (6x).—This is a valuable remedy, especially where the mouth is very hot and sensitive, and the ulcers bleed easily.

Hydrastis (2x).—In nursing women and weakly children, especially after mercury or the chlorate of potash; tongue swollen, with yellow coating, thick tenacious mucus. Many use Hydrastin (2x) in preference.

MEMBRANOUS STOMATITIS.

Synonym.—Croupous stomatitis.

Definition.—A form of stomatitis heretofore usually classed with the aphthous variety, but distinguished from that by the greater area of the inflamed spots, and by the formation of a croupous exudate of false membrane, which, on being removed, leaves a larger and deeper ulcer.

Etiology.—Membranous stomatitis may be diphtheritic, in which case a much deeper ulcer results than in the ordinary croupous variety. The latter, in the newborn, is usually the result of a syphilitic or gonorrhœal infection. It may also arise from mechanical or chemical irritants.

Symptoms.—If diphtheritic in character the usual symptoms of diphtheria are present; otherwise the symptoms and course do not differ materially from those of the aphthous variety.

Diagnosis.—It can only be differentiated from aphthous stomatitis by the presence of the false membrane, or croupous exudate, instead of the follicular exudate. If diphtheritic in character, that fact may be easily ascertained by the usual tests.

The *Prognosis* and *Treatment* depend entirely upon the cause, and can only be distinctively considered in connection with the respective diseased conditions upon which membranous stomatitis depends.

ULCERATIVE STOMATITIS.

Synonyms.—Fetid Stomatitis, Putrid Sore Mouth.

Definition.—An acute inflammation of the mucous membrane of the mouth which results in extensive and deep ulcerations, and characterized by great fetor of the breath.

Etiology.—This variety of stomatitis is usually found in children only. It occurs after the first dentition and generally before the eighth year of age. It is more often found in the hovels of the poor, and results from unsanitary surroundings, uncleanness, bad air, poor food, neglect of the teeth and mouth, especially with carious teeth, and more

often prevails during a prolonged term of damp, cold weather, especially in the spring and autumn. It may occur as an endemic in camps, jails, and institutions where children are crowded together under defective sanitary conditions. It is probably contagious as it sometimes occurs as an epidemic. It has been claimed the disease is the same as the hoof and mouth disease of animals, and that it is conveyed in milk, but the truth of this claim has never been fully demonstrated. Payne considers the disease identical with contagious impetigo. It may also be produced by scurvy and by the irritant effects of lead and phosphorus. *→ Per. 1. 1. 1.*

Symptoms.—The disease usually begins at the margins of the gums, which become congested, red, swollen, bleed readily, and separate from the teeth. A firmly adherent deposit soon appears in patches of a grayish-white color, sometimes darker, even black, from disintegration. This soon becomes soft and pulpy, sloughing off and leaving irregular-shaped ulcers. The teeth often become loosened and necrosis of the alveolar periosteum may occur.

The inflammatory process usually extends to the inner side of the lips, cheeks, and to the tongue; but ulceration of these parts rarely occurs. Mastication and deglutition are quite painful, and salivation is always present, the saliva being mixed with blood and shreds of pulpy matter. The appetite is impaired, the digestion and bowels are deranged, and the breath fetid. The submaxillary glands are nearly always enlarged. Nausea, vomiting and diarrhea often supervene.

Diagnosis.—There is little danger of confounding ulcerative stomatitis with any other disease, unless it be gangrenous stomatitis which runs a more rapid course, and presents more constitutional symptoms.

Prognosis.—Under proper treatment the prognosis is favorable, but neglect may result in serious conditions and even death.

Treatment.—The *hygienic treatment* of ulcerative stomatitis is of the utmost importance. All possible exciting causes should be removed, and the patient should receive only light, nourishing food and pure air and be warmly dressed. Absolute cleanliness is imperatively necessary, listerine, borolyptol, or some other antiseptic mouth wash should be frequently used. Chlorate of potash, in solution (5 grains to the ounce), is almost universally recommended. By the old school it is used much stronger and is considered almost a specific. A study of the pathogenesis of this drug shows that it produces an actual ulcerative stomatitis, and its application either locally or internally is homœopathic, and demonstrates, on the evidence of Old School authority, the truth of the law of cure and the superiority of homœopathic remedies. If there is much fetor, a weak solution of permanganate of potash should be used. I have found that hydrogen dioxide is the simplest and most effective

local remedy. It should be diluted with five parts of water. Baptisia tincture, one part to three of water, is often efficacious.

Mercurius sol. (3 x).—This is the most important remedy. There is great fetor; tongue swollen and flabby, showing indentation of teeth; teeth loose; profuse salivation.

Argentum nit.—Fetor; ptyalism; violent thirst; eructations of gas from the stomach. The second dilution freshly prepared is usually employed.

Baptisia (1 x).—Breath very putrid and offensive; mucous membrane dark purple; gums loose, flabby; watery, foul stools; feeble state and great prostration.

Nitric acid. (3 x).—Foul odor; fauces dry and burning; splinter-like pains; ptyalism; especially after mercury.

PARASITIC STOMATITIS.

Synonyms.—Thrush, Muguet, Sprue, Soor, White Mouth, Stomatitis Mycosa.

Definition.—A specific fungus disease characterized by the presence of a parasitic plant, the *oidium albicans*, which results in the formation upon the mucous membrane of the mouth of small whitish spots or flakes which rapidly coalesce and spread, and always associated with disorders of the digestion and of the bowels.

Etiology.—The disease is caused by improper feeding, especially uncleanness in nursing, or failure to thoroughly cleanse the nursing bottle, as well as by other unhygienic conditions, and from the acid fermentation of remnants of food, especially saccharine. Such causes are especially apt to operate if the patient develops a catarrhal stomatitis. It ordinarily attacks children under two years of age, but may occur in adults during the last stages of fevers, tuberculosis or cancer.

Symptoms.—The disease first appears on the tongue, on which whitish points appear which rapidly coalesce, forming large patches, and spread to the cheeks, lips, and hard palate, and often to the pharynx and esophagus, and even the stomach and intestinal tract. These thrush spots closely resemble curdled milk owing to their color and soft consistency. Later on they may become yellow or even brown from the admixture of blood. In simple cases the patches are superficial and easily removed, leaving a smooth surface; but when resulting from grave gastro-intestinal disease or some dyscrasia the attachments are deeper, more difficult of removal, and leave a bleeding, slightly ulcerated surface. The mouth is usually swollen and sore, and

the breath often fetid. There is great pain on nursing or mastication. Some fever may be present and a diarrhea of sour, green stools is almost always present.

Diagnosis.—The disease is easily recognized, but may be confounded with aphthous stomatitis, in which distinct ulcers are invariably preceded by vesicles. The following table is given by Anders, and expresses the main points upon which a safe discrimination may be based.

Parasitic Stomatitis (Thrush).	Aphthous Stomatitis.
Dryness of the mouth.	Salivation.
Whitish, raised spots or patches with no red areola; these are easily removed, leaving no ulcer and causing no bleeding.	An ulcer with a yellowish-white, depressed base, surrounded by a red areola. The base is removed with difficulty by forceps, and bleeding results.
Spots are numerous.	Usually few in number and discrete.
Begins in the form of minute spots.	Not so; ulcers appear, preceded by the formation of herpetic vesicles.
Ulcers not painful. Discomfort depends on the associated stomatitis.	Ulcers exquisitely tender
The characteristic thrush-fungus is always present in the deposit, and can be seen with the microscope.	No specific micro-organism determined, though probably present.

Prognosis.—In simple cases of thrush the prognosis is always favorable. When occurring in cachectic adults, or feeble, emaciated children with digestive or intestinal troubles, it may persist for a long time, and finally, with the existing complications, prove fatal. It may also occur near the end of fatal diseases.

Treatment.—Thrush is much more easily prevented than cured. Keeping the mouth clean, the food pure, and the vehicles of administration sweet and clean, will prevent thrush in probably every instance. In treating the disease, the same methods of cleanliness are indispensable. As there is always present an acid state of the secretions, this must be overcome, locally, as far as possible, by the frequent use of mild alkaline mouth washes. Borax or the sulphite of soda (1 dr. to 4 ounces of water) are most often used. Limewater is frequently employed. All sugars and starchy food should be proscribed for obvious reasons. The local treatment advised in other forms of stomatitis may be equally useful in thrush. Especially is the hydrogen dioxide of great value. The remedy required will depend mostly upon the general constitutional symptoms and the correction of any dyscrasia that may be present. As in

other forms of stomatitis we find *Mer. sol.* (3x), most often indicated, but cases may call for *Arsenicum* (3x), *Baptisia* (1x), *Cal. carb.* (6x), *Lachesis* (6.), *Muriatic acid* (2x), *Nitric acid* (3x), *Hepar* (3x), *Phytolacca* (2x), *Sulphur* (30x), *Sulphuric acid* (2x), or some other remedy. *Borax* (3x) should be considered as an important homœopathic remedy, but it would be useless to prescribe it if the same drug in a crude form were being used locally.

GANGRENOUS STOMATITIS.

Synonyms.—Noma, Cancrum Oris, Water Cancer.

Definition.—A rapidly spreading gangrenous ulceration of the cheek and gums resulting in extensive sloughing and destruction of the affected tissues.

Etiology.—This disease is occasionally seen in adults, but is practically limited to feeble, sickly children, or those under very unhealthy surroundings, or when recovering from fevers or eruptive diseases, especially measles. It occurs more frequently in girls than boys.

Symptoms.—Noma usually first appears as a sloughing ulcer on the gums or inside of one cheek near the corner of the mouth. The ulceration spreads rapidly, the cheek becomes swollen and edematous, and a little hard, sensitive nodule may be outlined by grasping the cheek between the thumb and fingers. The outside skin becomes brawny over the diseased spot, rapidly changing to a deeply livid gangrenous appearance, followed by a bulla filled with ichorous fluid, the skin softening and breaking down and leaving a black eschar. The cheek is perforated in severe cases in from three days to one week. The tongue and chin often become implicated, and even the bones of the jaw and the eyelids and ears of the affected side may become involved, but the disease rarely extends to the opposite side of the face. From the first the gangrenous odor of the breath is characteristic. The symptoms of constitutional disturbances become rapidly severe. The temperature runs to 103° or 104°, the pulse rapid and feeble, extreme prostration and exhausting diarrhea, death usually resulting within a week or ten days. Septic lobular pneumonia is a not uncommon complication, and a few cases are reported in which colitis, and gangrene of the female genitals have been seen. In the very few cases that recover, granulation and cicatrization take place, resulting in great disfigurement of the face and local disability.

Diagnosis.—The gangrenous appearance, the ulcer nodule and the offensive gangrenous odor are sufficient to establish a safe diagnosis.

Prognosis.—Nearly all cases die, very few recoveries being recorded. Bogel gives the mortality at 80 or 90 per cent.

Treatment.— In severe cases, especially, the first thing to be considered is the control, if possible, of the local conditions, and the limitation of the spread of the gangrene. This is usually attempted by the use of escharotics, such as fuming nitric acid or the acid nitrate of mercury. The Paquelin cautery is probably the safest and best. If this plan is not adopted, the wound must be almost continually cleansed with some antiseptic solution. Carbolic acid, hydrogen dioxide, and permanganate of potash are best. Sometimes it will be found better to use a charcoal poultice containing boric acid, which is a deodorizer, and will more effectually cause a separation of the slough which is all-important. The system should be sustained by nourishing food, and even stimulants may be used to advantage. If food can not be taken by mouth, rectal feeding must be resorted to. The remedy most often required is *Arsenicum* (3x), though either *Lachesis* (6.), *Thuja* (3x), *Merc. dulcis* (2x), *Nitric acid* (3x), *Carbo veg.* (6x), *Phytolacca* (2x), *Hydrastin* (2x) or *Kali chlor.* (2x) may be indicated. It is most often in grave diseases, such as gangrene, that are considered almost hopeless, that the power and efficacy of homœopathic remedies is most satisfactorily displayed, and in no case of gangrenous stomatitis should the administration of the indicated homœopathic remedy be neglected, no matter how important or necessary may be the local treatment.

MERCURIAL STOMATITIS

Synonym.— Ptyalism.

Definition.— An inflammation of the mouth and salivary glands resulting from the use of mercury.

Etiology.— Ptyalism may result from mercury whether administered internally, inhaled, or absorbed by the skin. There is a great difference in the individual susceptibility, some being salivated by a much less quantity of the drug than others, which is sometimes due to the presence of a constitutional dyscrasia. Ptyalism is liable to result from repeated small doses, as has been several times demonstrated, where the lower homœopathic triturations of mercury have been prescribed.

Symptoms.— The patient first complains of a metallic taste in the mouth. This is followed by red, sore and swollen gums, and soon there occurs a great increase in the secretion of saliva; the breath becomes fetid, the tongue swollen, and ulceration may supervene, causing a loosening of the teeth and necrosis of the jaw.

Diagnosis.— There is little chance for a mistake in diagnosis, as ptyalism rarely occurs except from mercury, and a history of the case establishing this cause is usually easily obtained.

Prognosis.—The prognosis is favorable, recovery usually taking place in two or three weeks. Should the teeth loosen and the jaw become necrotized, the case becomes much more tedious, and serious deformity may remain, though such cases are much less common than formerly.

Treatment.—But little local treatment is necessary. Mild antiseptic mouth washes may be of some benefit. The diet is necessarily liquid, and should be highly nourishing. The *chlorate of potash* is frequently used both locally and internally and is homœopathic. *Nitric acid* (3x) or *Hepar sulph.* (3x) are the remedies almost invariably required. The symptoms of *Nitric acid* are almost identical with those of mercury, and its antidotal effects to the latter drug are simply marvelous. In long-standing cases of mercurial poisoning it will, in homœopathic attenuations, often induce a genuine mercurial salivation and bring relief to all the symptoms.

GLOSSITIS.

Definition.—An inflammation of the tongue, which may be either acute or chronic, and may involve only the mucous membrane or pervade the parenchyma, being known respectively as superficial and deep seated.

Etiology.—Acute glossitis is usually the result of some direct irritant, such as the contact of hot liquids, steam, acrid or corrosive substances, or the stings or bites of insects. The deep-seated variety may follow the superficial when resulting from the causes named; and is also observed as a secondary disease occurring in the course of certain infectious diseases, such as erysipelas, pyemia, variola, etc. Chronic glossitis may follow the acute variety, or result from the use of tobacco, especially the pipe; or from spirituous liquors, or from the habitual use of irritating foods.

Symptoms.—Acute glossitis begins with intense hyperemia, redness and swelling, even protruding beyond the teeth. The organ becomes excessively tender and painful, and its surface is soon covered with a thick secretion of a grayish-white color, or it may become dry, cracked, and ulcerated. Mastication and deglutition are extremely difficult, and even talking and breathing are rendered difficult and distressing, death sometimes resulting from suffocation. The cervical and sublingual glands are usually swollen. There is usually considerable fever and restlessness with great anxiety. The course of the disease is rapid, reaching its greatest intensity in from one to three days and then rapidly subsiding; or circumscribed suppuration may occur with the consequent local and constitutional symptoms, and leaving behind a cicatrix that seriously

impairs the mobility of the tongue. Fluctuation is not often marked, and a spontaneous rupture of the abscess is the first intimation of its presence. In chronic glossitis there are few symptoms; pain and soreness, aggravated by movement of the tongue being usually the only complaint of the sufferer; but the surface of the tongue presents a reddened appearance and smooth, shining, irregular patches, with occasional superficial furrows.

Diagnosis.— This is readily established by the history of the case and the local appearances.

Prognosis.— The prognosis is favorable, though chronic glossitis is often very intractable.

Treatment.— Ice internally and externally, or hot water held in the mouth and applied externally are the most efficient auxiliary measures. If abscesses form, they should be treated the same as if located elsewhere — incision followed by hydrogen dioxide or other mild antiseptic washes. If deglutition is impossible, rectal alimentation must be resorted to. In chronic glossitis the cause must be removed, the patient fed on bland, but nourishing foods, the mouth frequently rinsed with borolyptol or some similiar preparation, and the indicated remedy persistently administered.

Belladonna (3x) is the chief remedy to consider in the first stage, and is nearly always indicated by the intense heat, swelling and pain. *Belladonna* is the remedy most likely to be indicated in inflammations that tend to local suppuration, and glossitis is no exception.

Later on *Merc. sol.* (3x) may be required, especially if there is ulceration, salivation, a flabby tongue. If suppuration takes place, *Hepar sulph* (3x). If the suppuration persists, *Silicea* (6x). *Apis* (3x to 30x) if there is edema and burning, stinging pain. *Arsenicum* (3x), great burning, tongue dry, cracked and ulcerated; especially the chronic form.

II. DISEASES OF THE TONSILS.

ACUTE TONSILLITIS.

Definition.— An acute inflammation of the tonsils.

Varieties.— (1) Simple, catarrhal, or superficial. (2) Follicular. (3) Parenchymatous.

Etiology.— All varieties of tonsillitis occur most often in the young, and in the male oftener than in the female, being most common during the period of adolescence. The follicular variety is most apt to occur at the transition periods of the year, in the spring or late autumn. It is most often excited by exposure to cold and wet, or sudden extreme changes from warm to cold weather. The follicular variety, in particu-

lar, is caused by bad hygienic surroundings, sewer gas, bad drainage, smoke, and poisonous vapors. Using the voice in a cold, damp or impure atmosphere will excite tonsillitis. It may also occur in the course of specific infectious diseases, especially scarlatina and erysipelas; and is sometimes due to traumatism. One attack predisposes to another, some subjects being particularly susceptible to the infection. Whether this is due to a rheumatic diathesis, as is very generally claimed, or to a strumous habit, or is simply hereditary, is not well established. Tonsillitis, especially the follicular variety, being quite commonly associated with that familiar catarrhal condition, erroneously termed grip, it is often claimed that the disease is grip and is excited by microbes. To me this theory is untenable, as I can see nothing in the so-called grip symptoms more than is common to most acute catarrhal processes. The fact that tonsillitis, especially follicular, is often associated with symptoms of gastric or biliary disturbance, has led to the assumption that it is often brought about by such conditions of the system, though after all it must be observed that in most such cases at least, the primary exciting cause of the gastro-hepatic disturbance appears to be exposure to cold or to noxious influences as heretofore mentioned.

SIMPLE, CATARRHAL OR SUPERFICIAL TONSILLITIS.

Definition.—An acute inflammation of the tonsils affecting only the mucous membrane, and usually associated with acute pharyngitis.

Symptoms.—The patient first complains of pain and difficulty in swallowing, the pain often becoming severe and extending to the ear and the lymphatics at the angle of the jaw. An examination of the throat shows the mucous covering of the tonsils uniformly swollen, red and usually covered with a tenacious mucus. The uvula and faucial pillars often partake of the same appearance, and in many cases the entire pharynx. Simple stomatitis is often present, and salivation and fetor of the breath by no means uncommon. The constitutional disturbances are slight, the fever being moderate and the general systemic disturbances scarcely observable. The affection runs a rapid course, and subsides within two or three days.

Diagnosis.—The diagnosis is simple as the catarrhal character of the inflammation is easily recognized.

Prognosis.—Always favorable, the duration of the disease however depending largely upon the amount of extension to contiguous surfaces. Otitis media sometimes follows and protracts the case.

Treatment.—Simple antiseptic washes or sprays are about the only auxiliary measures required. As a rule *Belladonna* (2x) at first and *Merc. sol.* (3x) later on are the remedies indicated and all required,

though any remedy hereafter mentioned for tonsillitis may in exceptional cases be demanded.

ACUTE FOLLICULAR TONSILLITIS.

Synonyms.—Lacunar Tonsillitis, Diphtheritic Sore Throat.

Definition.—An acute inflammation of the tonsils involving the follicles and characterized by a cheesy-looking exudation in the crypts, attended with more or less severe constitutional disturbances.

Symptoms.—Inspection in the first stages shows the tonsils to be red, swollen, and presenting small yellow spots on their surfaces, which is simply the protrusion from crypts of the exudate that is present and fills the lacunæ, this being composed chiefly of epithelial *débris* and pus cells, and later on containing micrococci and bacteria. Frequently these small points of exudate coalesce and give the appearance of a diphtheritic membrane. Sometimes, especially in adults, a calcareous infiltration occurs. The patient first complains of chilliness, soon followed by a rapid rise in temperature, and accompanied by more or less severe aching pains in the back and limbs. The throat is sore, and swallowing painful and difficult. A nasal twang in the voice is usually present. The tongue is heavily coated, the breath foul, the urine highly colored and loaded with urates. The constitutional symptoms are of rapid occurrence, and in their intensity are entirely out of proportion to the severity and extent of the local disease; but they usually abate with equal rapidity, the disease rarely lasting more than a week, though the swelling of the tonsils may remain for some time. Occasionally febrile albuminuria follows an attack, and cases of endocarditis and pericarditis have been reported. Sometimes also softening and degeneration of the exudate occurs, giving an offensive odor, and retarding complete recovery. In still other cases the exudate undergoes calcification and may be expectorated in chalky masses, or remaining, necessitate removal, even the excision of the tonsils being sometimes necessary.

Diagnosis.—It is quite often very difficult to distinguish between follicular tonsillitis and diphtheria. Anders gives the following excellent differential table:—

Follicular Tonsillitis.

A soft, pultaceous yellowish-white deposit occurs in spots or patches situated over the mouth of the follicles, with areas of redness intervening.

The exudate is easily removed, leaving a smooth surface.

Diphtheria.

A tough, ashy-gray, continuous and uniform pseudo-membranous deposit covers the tonsils.

Very adherent, and can be torn off in strips only, leaving a bleeding erosion.

The deposit is limited to the tonsils (important).

If the creamy deposits unite to form a continuous layer, removal is either not followed by re-formation, or very late.

May have high temperature, but lasting only a day or two. Albuminuria extremely rare, if present at all.

Cervical lymphatic glands seldom or slightly swollen.

Complications rare and mild.

Cellular detritus, bacteria, etc., in deposit.

The pillars of the fauces and uvula are involved as well.

Removal of the membrane is followed by re-formation within twelve to twenty-four hours.

Persistent elevation of the temperature; more or less albuminuria is common.

Usually marked swollen glands.

Complications frequent and grave.

Fibrinous exudate, etc., containing the Klebs-Löffler bacillus.

Prognosis.—The prognosis as to recovery is always favorable, but as has been seen, complications may retard convalescence.

Treatment.—The patient should be isolated until the diagnosis is fully established, and all sources of contamination from irritating or poisonous gases should be removed. The throat should be sprayed with borolyptol or some mild antiseptic solution. In the first stages, and until the violent constitutional symptoms begin to subside, *Belladonna* (2x) is most often indicated, but as soon as the exudate is established *Merc. iod.* (3x) is called for in most cases. If the swelling of the tonsils predominates, *Merc. biniod.* (3x) is preferable. *Kali bichrom.* (3x) is often a valuable remedy, worse on left side; hawking of much tenacious mucus; shooting from throat to ear. *Kali mur.* (6x). This remedy is considered by many as a specific in follicular tonsillitis. The throat has a gray look spotted with white. Raue claims that *Ignatia* is almost a specific, and Goodno makes a similar statement; but such has not been my experience, nor do I think that either the pathogenesis of the drug or clinical experience warrants the statement. Also consult remedies under the next heading.

ACUTE PARENCHYMATOUS TONSILLITIS.

Synonyms.—Amygdalitis, Phlegmonous Tonsillitis, Suppurative Tonsillitis, Tonsillar Abscess, Quinsy.

Definition.—An inflammation of the tonsils involving the stroma, with tendency to suppuration.

Symptoms.—Inspection reveals one or both tonsils greatly enlarged, deep red, more or less edematous and firm to the touch. The half arches and posterior border of the soft palate and the uvula are also red and swollen. From the first the patient complains of dryness of the throat, and pain and difficulty on swallowing. The temperature rises rapidly to from 102° to 105° F. The pulse is full and strong, ranging from 110 to 130. A secretion of viscid mucus soon takes place, which

sometimes becomes very excessive and causes great annoyance. The pain is frequently referred to the angle of the jaw, or extends to one or both ears, according as one or both tonsils are involved. The voice becomes hoarse and may be altogether lost. The glands of the neck enlarge, the lower jaw becomes fixed, and the patient is unable to open his mouth. Prostration is great. These symptoms may subside after a few days and resolution take place, which is, in my experience, the usual thing under homœopathic treatment. Unfortunately, however, many cases go on to suppuration. Softening and fluctuation may generally be detected. The throat becomes more painful, the pain becoming throbbing in character, the temperature and pulse increase, the breath often becomes excessively fetid, prostration becomes extreme, and the general appearance of the patient is one of extreme gravity. Suddenly, after the case has lasted about 8 or 10 days, the tonsillar abscess bursts, a quantity of pus escapes from the mouth, the patient experiences instant relief, and the constitutional symptoms at once abate. If both tonsils are involved, only one suppurates as a rule, or only one at a time. Very rarely suffocation results from the entrance of the pus into the larynx, or, when the suppuration is peri-tonsillar, it may open above the clavicle, or may involve the internal carotid, causing fatal hemorrhage. Edema of the larynx may also occur. Chronic enlargement of the tonsils is the most frequent sequel.

Diagnosis.—The diagnosis is easily established. The only possible error might be in connection with scarlet fever, which gives a history of contagion, commences with vomiting, soon develops the characteristic eruption, and presents a pulse-rate out of all proportion to the fever.

Prognosis.—The prognosis as to recovery from the immediate attack is almost invariably favorable, but subsequent attacks are liable to occur from comparatively slight exciting causes, especially in strumous subjects. The grave complications previously mentioned are of rare occurrence.

Treatment.—I am confident that many cases of Quinsy can be aborted in the immediate first stage by means of gargles of very hot water and the administration of *Belladonna* (2x). I generally employ a three-per-cent solution of boric acid as a gargle, given as hot as the patient can bear, every 15 minutes. In the case of children too small to use a gargle, I would employ a steam atomizer. Hot applications in the form of poultices or fomentations should also be employed. The tonsils should be frequently examined and opened as soon as fluctuation is observed, thus saving the patient many hours of suffering. To do this, use a curved bistoury, wrapping the blade nearly to the point with adhesive plaster or cotton. If the breath is fetid, use a mild antiseptic spray or gargle.

It is claimed that when suffocation is imminent from the tonsillar enlargement, that the tonsil should be excised, or tracheotomy or intubation performed. I have never seen a case requiring such measures. Throughout the height of the disease the diet should be light, and of necessity liquid, such as milk and broths or cereal porridges. During convalescence, semi-liquid and soft light foods may be allowed gradually. During the entire course of the disease the carefully selected remedy should be persistently administered. The following are the remedies most often required:—

Belladonna (2x).—In most cases Belladonna is the remedy indicated in the first stage, and such being the case, will often disperse the inflammation before suppuration takes place. The swelling is bright red, generally worse on the right side; neck swollen externally and painful to touch and motion; swallowing difficult, especially liquids; strong pulse; rapidly rising temperature; throbbing carotids; headache;

Apis (3x).—Probably next to Belladonna in importance in the first stage of tonsillitis, and frequently called for later on. The chief indication for *Apis* is the edematous appearance not only of the tonsils, but also of the contiguous surfaces and of the glottis. The tonsils are swollen; bright red; stinging pains when swallowing; hoarse voice; difficult breathing; thirstlessness.

Merc. sol (3x).—After Belladonna and other measures have failed to abort an attack, and suppuration is imminent, *Mercurius* will sometimes, when indicated, cause absorption and bring about resolution. I prefer the *Merc. sol.* Tonsils and fauces of a coppery red color, and covered with viscid tenacious mucus; sharp, sticking pains when swallowing; fetid breath; ptyalism.

Lachesis (6.).—Pain, soreness and swelling of the left tonsil, with a tendency to extend to the right side; inability to swallow, with pain shooting into the ear (left) when the attempt is made; aggravation from hot drinks; fluids are swallowed with more difficulty than solids, and are returned through the nose. Excessive tenderness of the throat to external pressure. Peri-tonsillar abscess.

Merc. iodatus (3x).—Either the *protoiodide* or *biniodide* of *mercury* may be required, the former seldom except where there is more or less follicular exudation. *Merc. biniodide* (3x) is often needed, especially after Belladonna, where the tonsils are hard and greatly swollen; worse on left side; fauces dark red; diphtheritic patches; painful swelling of submaxillary glands.

Hepar sulph. (3x).—This remedy generally follows well after Belladonna and *Mercurius*; suppuration being inevitable, it hastens the process. For this purpose it should be given low. Given in a high

potency and earlier if well indicated; it may prevent suppuration. Swelling of the tonsils and glands of the neck, parts extremely sensitive to touch; sensation, when swallowing, as if a fish-bone or splinter were sticking in the throat.

Kali bichrom. (3x).—Tonsils red, swollen, painful and finally ulcerated; surrounding tissues dark, livid and swollen; hawking of much tenacious mucus; uvula edematous; sharp, shooting pains in left tonsil, extending toward the ear; relieved by swallowing.

Phytolacca (2x).—Tonsils are swollen and bluish, usually worse on the right side, throat dry, swallowing difficult, with every attempt excruciating pains through both ears.

Lycopodium (6x).—Swelling and suppuration of the tonsils, extending from right to left.

Baryta carb. (6x).—Comparatively mild cases and in those who are very sensitive to cold air, and always when exposed, have tonsillitis with a tendency to suppuration. It removes the predisposition.

Silicea (6x).—Tonsils swollen, inflamed; and abscesses form, which refuse to heal; especially on the left side; fistulous ulcerations. Peritonsillar abscess.

Sulphur (6x to 30x).—Tonsillitis, first on the right side, then on the left. Scrofulous diathesis. Patient makes a very tardy recovery.

Tooker recommends *Tartar emetic* as an important remedy, giving it a place ahead of *Mercurius*, but this does not accord with my experience or with the pathogenesis of the drug.

CHRONIC TONSILLITIS.

Definition.—A chronic enlargement of the tonsils, which also includes the adenoid tissue in the vault of the pharynx.

Etiology.—Hypertrophy of the tonsils occurs most often in children between five and fifteen years of age. It may be congenital, especially in strumous or syphilitic children. It is most often excited by previous attacks of tonsillitis, and may follow diphtheria or scarlet fever.

Symptoms.—There are no constitutional symptoms that are uniformly present. Mouth breathing is the first symptom noticed; and it is likely that it is this that brings about many of the symptoms of perverted local and systematic disturbances that are so frequently met with in children who have enlarged tonsils. The mouth breathing is loud and labored, and especially at night deep snorting and irregular, greatly disturbing sleep. Often night terrors are present, and the patient may be wakened at times by paroxysms of dyspnea due to reflex spasm of the glottis. Swallowing is difficult, the hearing more or less impaired, the sense of taste and smell deficient and an accumulation of mucus in

the pharynx causes constant hawking. The voice becomes nasal and there is a very indistinct or changed articulation of consonants *n* and *m*, and *l* and *o*. The morbid respiration eventually induces some remarkable changes in the face, mouth and chest. The expression of the face becomes heavy, stupid and apathetic, and with this there is manifest a stubborn, irritable disposition, and a slowness of perception. The lips are thick, the anterior nares dilated with a pinched appearance, and the eyes have a vacant stare.

Three types of deformity occur in connection with enlarged tonsils and are supposed to result from the prolonged interference with respiration. These are known as the pigeon or chicken breast, the barrel chest, and the funnel breast, according to the shape the deformity may assume.

Diagnosis.—Inspection readily establishes the diagnosis. If adenoid growths are present without enlargement of the tonsils they are felt by inserting the finger in the naso-pharynx.

Prognosis.—Chronic tonsillitis rarely results fatally, though it may eventually induce secondary conditions that will destroy life. Patients having enlarged tonsils are more susceptible to colds, and acute respiratory troubles, which are much more grave than under ordinary circumstances. These are also more liable to angina and diphtheria, and the consequences more than usually serious. Adenoid growths, if removed, rarely return, and usually disappear spontaneously though gradually after puberty.

Enlarged tonsils may also disappear spontaneously as age advances.

Treatment.—Admitting that active surgical procedures are sometimes advisable and necessary, yet I must contend that in a great many, I think a majority of the cases, a cure can be brought about by the administration of carefully selected homœopathic remedies. I have seen many cases where the tonsils were enlarged and had been completely honey-combed by repeated attacks of follicular inflammation, the tonsil being practically destroyed. In such cases no medicine could be expected to restore the normal anatomy of the organs, and their removal was necessary to the health and comfort of the patient.

The *hygiene* of the patient should be carefully watched. The diet should be nutritious. Plenty of fresh air and sunshine, daily baths, and all other means for benefiting the circulation and improving the general tone of the system should be adopted.

The remedies most often required are *Merc. iod.*, (3x) *Merc. biniod.* (3x), *Baryta carb.* (6x), *Baryta iod.* (3x), *Arsen. iod.* (3x), *Kali bichrom.* (3x), *Calc. iod.* (2x), *Calc. phos.* (3x), *Hepar sulph.* (3x), and *Sulphur* (30x). Tooker recommends *Fucus ves.* I have had best results from the salts of baryta, especially where the patient is prone

to acute attacks every time he takes cold. With the strumous diathesis, and the characteristic leucophlegmatic temperament of *Calcareia*, the *Calc. iod.* is the best remedy.

III. DISEASES OF THE PHARYNX.

PHARYNGITIS.

Definition.—An inflammation of the mucous membrane of the pharynx, which may be either acute or chronic, simple or membranous.

ACUTE PHARYNGITIS.

Synonyms.—Pharyngitis Acuta Simplex, Simple Acute Pharyngitis, Acute Catarrhal Sore Throat, Simple Angina.

Etiology.—Pharyngitis occurs most often in young people, and is usually the result of exposure to cold, or sudden changes of temperature, or climate, or may be caused by irritating vapors. Those suffering with digestive troubles or possessing a gouty, rheumatic, or scrofulous diathesis are more liable to contract the disease. Acute pharyngitis is frequently associated with tonsillitis and laryngitis, and may be complicated with erysipelas and the eruptive fevers.

Symptoms.—Inspection reveals a red and swollen mucous membrane, which is dry and glistening, with patches covered by a sticky yellowish-white secretion. The attack is ushered in with chilliness and slight fever; headache; coated tongue; bad taste and foul breath; dryness and soreness in the throat, especially on swallowing; sensation of dryness and tickling with a hacking cough and constant desire to clear the throat, due to the increased length of the uvula; sometimes there is hoarseness from extension to the larynx, and earache and deafness from extension through the Eustachian tubes. There is stiffness and tenderness of the muscles of the neck, and the lymph-glands are often involved. Often the process is but a part of a general naso-pharyngeal catarrh. The disease usually lasts from three to five days.

Diagnosis.—The appearance of the throat is sufficient to establish the diagnosis. The tonsils are often involved in the general catarrhal inflammation, but the moderate degree of fever present serves to exclude parenchymatous tonsillitis.

Prognosis.—The prognosis is favorable, the disease lasting only a few days.

Treatment.—Persons susceptible to attacks of acute pharyngitis should use every effort to improve the general health by a wholesome and nutritious diet, daily cold bathing followed by brisk rubbing, and avoiding exposure. During the attack relief may be obtained by hold-

ing small pieces of ice in the mouth, or gargling with hot water, or using a steam atomizer with hydrastis, eucalyptus, or pine needle. The remedies most frequently indicated are *Bell.*, *Apis*, *Arum triph.*, *Baptisia*, *Canth.*, *Capsic*, *Gelsem*, *Fer. phos.*, *Hepar*, *Guaiacum*, *Kali bichrom.*, *Lach.*, *Lycop.*, *Merc. cor.*, *Merc. iod.*, *Merc. sol.*, *Nux. vom.*, *Phytol.*, *Rhus tox.* The indications for the most of these remedies have already been given in the chapter on parenchymatous tonsillitis, and need not be repeated. The indications for the additional remedies mentioned are as follows:—

Arum triph. (2x).— Lips and corners of the mouth cracked and bleeding; the throat and tongue are so sore that the patient refuses both food and drink.

Cantharis (3x).—Throat feels on fire; constriction and intense pain at the back of the throat; difficult deglutition.

Capsicum (3x).—Dark redness of the throat, with a burning, pungent sensation in the pharynx; fetid breath; burning and constriction worse between the acts of deglutition; dry, teasing cough from elongation of the uvula.

Gelsemium (1x).—Dryness and soreness of the throat; swallowing causes shooting pains in the ears; chilliness in the back; languor and drowsiness, characteristic headache.

Merc. cor. (3x).—Violent burning pain; fauces and uvula dark red; symptoms all intense.

Nux vom. (3x).—Throat feels rough, raw and sore, as if scraped; constant hawking; sensation as of a plug or lump in the pharynx when swallowing; dry cough with headache, and pains in the hypochondria when coughing; soreness in the stomach and abdominal walls; cross and irritable; morning aggravation.

Rhus tox. (3x).—Fauces and pharynx edematous; the curtain of the palate puffed and pink; uvula elongated, puffed, translucent, the end nearly spherical, looking like a great drop of fluid or jelly just ready to drop off; vesicles in the pharynx and on the palate and uvula; intolerable roughness of the pharynx and larynx; great debility.

MEMBRANOUS PHARYNGITIS.

Definition.—An acute inflammation of the mucous membrane of the pharynx, characterized by the formation of a false membrane distinct from that of diphtheria.

Etiology.—This variety of pharyngitis is found during the prevalence of epidemics, especially scarlet fever, and particularly in persons in poor health, in whom it seems to be brought about by exposure to cold or impure air.

Symptoms and Diagnosis.—The constitutional symptoms are comparatively slight. There is a mild fever and some headache. The throat does not become intensely sore. The exudate soon appears in patches, is thin and of a whitish color, has no odor, and is easily detached, leaving a red, but not a raw, and bleeding surface, as in diphtheria. The difference between these diseases is very apparent.

Prognosis.—The prognosis is favorable, the whole process lasting but a very few days.

Treatment.—Mild antiseptic sprays, hydrogen dioxide or boro-lyptol with the indicated remedy is all that is required. *Bell.* (3x), *Merc.iod.* (3x), or *Kali bichrom.* (3x), are the remedies usually indicated.

CHRONIC PHARYNGITIS.

Synonyms.—Chronic catarrhal sore throat; Chronic catarrhal angina; Chronic pharyngeal catarrh; Chronic naso-pharyngeal catarrh. Follicular pharyngitis; Clergyman's sore throat.

Definition.—A chronic inflammation of the mucous membrane of the throat, which may be simple or follicular, atrophic or hypertrophic, and may or may not be an extension of a nasal catarrh—naso-pharyngitis.

Etiology.—Chronic pharyngitis is more common during youth and middle life, and is more liable to occur in persons whose general health is below par, and particularly in those of sedentary habits. It may follow repeated acute attacks, or develop slowly from the following exciting causes: continued exposure to cold air; inhaling irritable vapors; tobacco smoke; over-use and strain of the voice, as in clergymen, singers, hucksters and auctioneers.

Symptoms.—Inspection shows a redness and thickening of the mucous membrane of the posterior wall of the pharynx and of the naso-pharynx, the veins being dilated and tortuous, and small reddish bodies projecting. This is the hypertrophic or follicular form of inflammation. On the other hand the mucous membrane may be dry, pale and glistening, the dilated veins also showing. This is the atrophic form. It is more apt to occur late in life, and frequently as a sequel of long-continued hypertrophic catarrh. If naso-pharyngeal there will be seen a collection of muco-pus adhering to the posterior wall, and extending down from the posterior nares. The uvula is usually elongated. The patient first experiences a dryness and stiffness in the pharynx, especially in the morning, with a sensation of a foreign body in the pharynx which requires considerable hawking to loosen and expectorate, it being an accumulation of mucus which has taken place during the night. During the day there is little expectoration. Swallowing is seldom

interfered with. The patient suffers little, but experiences much discomfort and annoyance.

In persons who use the voice much, the latter becomes feeble and husky, articulation is difficult and painful, and a hacking cough follows any attempt. The tone of the voice can not be controlled, changing from one key to another, first muffled and gruff, then high and squeaking. Sometimes there is, from time to time, complete aphonia. The symptoms of the voice vary greatly in different individuals, and in the same individual at different times. These symptoms occur late in the disease, and are due to an extension of the pharyngeal inflammation to the larynx. The general health is unimpaired, though late in the disease the patient may become debilitated, weak and nervous.

Diagnosis.—The history of the case and a careful inspection of the fauces will serve to exclude any possibility of specific disease, and the absence of pulmonary symptoms, both local and constitutional, will exclude tuberculosis.

Prognosis.—If the cause can be removed and the patient will follow instructions, the prospects for a cure are favorable; but the prognosis should always be guarded, as some cases are very intractable, and it is often quite difficult to eliminate unfavorable influences.

Treatment.—Remove the cause if possible. Proscribe tobacco smoking and the use of alcoholic liquors. Persons using their voice continually must cease doing so, even if a change of occupation be necessary. Local treatment is usually of little value. Especially is the use of astringents and nitrate of silver to be condemned, though temporary relief may often follow their use. The throat should be kept clean by mild antiseptic sprays, or hydrastis or eucalyptus. I have obtained much benefit from the benzoinol combinations, especially benzoinol with eucalyptus and pine-needle oil. The application of Calendula oil has been recommended. The chief dependence must be placed on proper hygienic treatment and the persistent use of the indicated remedy. The following remedies are most often required:—

Arum triph.(2x).—This remedy is often of value, especially in the follicular variety. There is much dryness, soreness, and burning pains; hoarseness and loss of voice, from long speaking; constant hawking and clearing the throat.

Alumina (6x).—Voice husky, hoarse or weak, especially in the morning on waking, rawness and soreness in the throat, with a sensation as if a splinter were sticking in the pharynx; the mucous membrane is dark red, has a glazed look, and is very dry, or there may be an accumulation of thick, tough mucus; uvula elongated and dark red; amelioration from warm food and drink.

Argent. met. (30x).—Talking or laughing produces much hoarseness, with copious accumulation of mucus, which is easily hawked up. Throat feels raw and sore during expiration and coughing; not on swallowing.

Argent. nitr. (6x).—Uvula and fauces dark red; much thick, tenacious mucus; rawness, soreness, and scraping in the throat; sensation of a splinter in the throat when swallowing.

Belladonna (3x).—Intense hyperemia and dryness of the throat; spasmodic contractions; husky, hoarse voice; dry, tickling cough.

Cantharis (3x).—Intense burning as if the throat were on fire.

Capsicum (3x).—Burning pains; spasmodic contractions; pains worse when not swallowing; especially in those who smoke and use alcoholic liquors.

Hepar sulph. (3x).—Constrictive sensation; smarting, rawness and scraping; sensation of a fish bone or splinter in throat; stitches extending to the ear; sensation of a plug when swallowing; hoarseness; sensitive to cold air.

Hydrastis (3x).—Roughness and rawness in throat, worse mornings; worse from swallowing, with soreness; hawking of yellow, tenacious mucus from posterior nares and fauces. Hypertrophic catarrh.

Kali bichrom. (3x).—Fauces swollen, red and painful; dryness in fauces in morning on waking, with painful swallowing; stringy, viscid mucus hangs from the posterior nares; hoarseness and accumulation of much stringy, viscid mucus in the larynx especially in the morning.

Kali chlor. (2x).—Follicular pharyngitis; throat red and tumid; white exudation; hoarseness; irritation to cough

Lachesis (6.).—Painful deglutition, with constant desire to swallow; spasmodic contraction of the fauces; hawking of mucus, with rawness and dryness of the throat; hoarseness; rawness and scraping in the larynx; external throat very sensitive to touch; solids swallowed more readily than fluids; worse on left side and worse after sleeping.

Mercurius (3x).—Any preparation of mercury may be indicated. The *Merc. sol.* or *vivus* when the throat presents a coppery red appearance; painfully dry and sensation of tightness; hoarse, rough voice; burning rawness in larynx; metallic taste; tongue coated, white, moist and flabby. *Merc. iod.*—Base of tongue covered with a thick, dirty-yellow coating; much tenacious mucus in the throat; hawking causes gagging; hoarseness and aphonia; fetid breath; salivation; worse on the right side.

Nux vom. (3x).—Throat raw, sore, rough as if scraped, in the morning, when swallowing, when inhaling cold air; voice hoarse; has to clear the throat constantly, especially in the morning; gastric and abdominal troubles.

Phytolacca (2x).— Fauces congested, dark red, with dryness, scraping, rawness and roughness; much aching in limbs; mucus hawked with difficulty from posterior nares; hangs down in strings.

Sanguinaria nitr. (2x).— “My sheet anchor in chronic follicular pharyngitis; the remedy to use in the absence of clear indications for another.” (Ivins).

Compare also the remedies recommended for chronic nasal catarrh and chronic catarrhal laryngitis.

ACUTE INFECTIOUS PHLEGMON OF THE PHARYNX.

Definition.—An inflammation of the mucous membrane of the pharynx that passes rapidly into a suppurative process.

The **Etiology** is not known.

Symptoms.—The symptoms are intense, and the constitutional disturbances severe. Following a soreness of the throat of short duration, and usually some hoarseness, the neck enlarges, the pharynx becomes swollen, injected and edematous, high fever, rapid pulse and supuration.

Consult *Bell.* (3x), *Apis* (3x), *Hepar sulph.* (3x), etc.

RETRO-PHARYNGEAL ABSCESS.

Synonyms.—Peri-pharyngeal Abscess, Post-pharyngeal Abscess, Abscess of the Pharynx.

Definition.—A suppurative inflammation of the cellular tissue lying between the posterior wall of the pharynx and the cervical vertebræ.

Etiology.—This disease is most common during the first two years of age, and in those of a scrofulous or syphilitic constitution. It is most often a primary disease without a known cause, probably severe or prolonged exposure, but may occur from wounds in the pharynx, or result secondarily from caries of the vertebræ, from ordinary throat inflammations and from specific fevers.

Symptoms.—Inspection of the pharynx reveals a round, bulging tumor in the middle line, firm and elastic to the touch. The patient first has pain and difficulty on swallowing, which later on, becomes almost or entirely impossible; the respiration is impeded and laborious; the voice nasal or metallic in tone; the neck is stiff and the head is held on one side. If idiopathic, the course is rapid, and fluctuation is soon observed, but when of secondary origin, it may require from one to two weeks.

Diagnosis.—The presence of the projecting tumor usually makes the diagnosis easy and positive.

Prognosis.—If a proper diagnosis is made early, the prognosis is favorable. If, however, the nature of the trouble is undiscovered, as is often the case, until spontaneous rupture occurs, suffocation may result from the passing of the pus into the larynx, if indeed it does not occur earlier from the size of the tumor.

Treatment.—*Bell.* (3x), *Merc.* (3x), and *Hepar sulph.* (3x) are the remedies to be chiefly considered. In most cases suppuration is established, or at least inevitable when the case is first seen, and *Hepar* should be given to hasten the process. *Apis.* (3x), *Arsen.* (3x), or *Lach.* (6.), may be required. The first named only, when there is great edema. As soon as fluctuation is observed, the abscess should be opened with a bistoury, guarded with cotton or adhesive plaster, after which the throat should be kept cleansed with hydrogen dioxide, borolyptol or a two-per-cent solution of boracic acid.

ANGINA LUDOVICI

Synonyms.—Ludwig's Angina, Cellulitis of the Neck.

Definition.—A diffuse inflammation of the connective tissue of the throat and neck.

Etiology.—The disease may be primary, or result from injury, but is usually secondary to specific fevers, especially scarlet fever and diphtheria.

Symptoms.—These are intense and develop rapidly. The swelling begins in the submaxillary region of one side, rapidly increases in size and involves the cellular tissue of the floor of the mouth as well as the anterior portion of the neck. Severe pain is present, talking and swallowing extremely difficult and respiration embarrassed. The face is edematous and presents a suffering, anxious expression. The breath is offensive and there is a profuse flow of fetid, viscid saliva. Edema of the larynx may supervene. There is some fever and sometimes delirium, with symptoms of sepsis. Resolution may gradually take place, but more often an abscess or extensive sloughing occurs.

Diagnosis.—The symptoms are so peculiar and obvious that a mistake in diagnosis is hardly possible.

Prognosis.—Recovery usually takes place in from ten to twenty days; but the prognosis should be guarded, as death may result from edema of the larynx, exhaustion or pyemia.

Treatment.—The remedies to be considered are chiefly *Bell.* (3x), *Merc.* (3x), *Hepar sulph.* (3x), *Silicea* (6x). Also consult *Apis* (3x), *Anthracinum* (30x), *Arsen.* (3x), *Ars. iod.* (2x), *Kreos.* (3x), *Lach.* (6.), *Phytolac.* (2x), *Rhus tox.* (3x), and *Tarantula* (30x).

The patient's strength must be sustained by nourishing diet and stimulants, and surgical measures often become imperative.

IV. DISEASES OF THE ESOPHAGUS.

ESOPHAGITIS.

Definition.—A catarrhal inflammation of the mucous membrane of the esophagus, some times extending to and involving the submucous tissues, and may be either acute or chronic.

Etiology.—Esophagitis is a comparatively rare affection, and usually exists only as a part of some morbid process involving the mouth, fauces, and stomach, usually catarrhal. It occurs in connection with acute infectious diseases and pneumonia, and may form a part of the membranous process of diphtheria, or the eruptive process of variola. It may occur in connection with cancer located in the tube or in the contiguous tissues. However, the chief cause of acute esophagitis is the intense irritation resulting from mechanical or chemical influences, such as the presence of foreign bodies, and the swallowing of corrosive poisons, acids or hot liquids. Chronic esophagitis differs but little from the acute form, and may follow it, or result from the prolonged action of the causes which produce it. In very rare instances it is caused by and associated with hepatic cirrhosis and chronic cardiac or renal disease.

Symptoms.—Esophagitis gives rise to but few symptoms, and their absence is no criterion as to the extent or gravity of the disease. There is usually a sense of constriction and a dull, aching pain beneath the sternum. In case a foreign body is present there may be spasm with dysphagia and regurgitation of food, the latter being covered with mucus, pus, blood or shreds of false membrane. The chronic variety is characterized by the presence of much glairy, tenacious mucus which rises into the pharynx.

Diagnosis.—The diagnosis in mild cases is often quite difficult, but in the more severe cases is quite readily established. The history of the case, the pain caused by the introduction of a sound, and the adherence to the sound of mucus, blood or pus is quite sufficient in most cases.

Prognosis.—The prognosis in mild cases is favorable, as they usually terminate within a few days, though superficial ulcers may form, and somewhat retard recovery. When produced by corrosive substances slow cicatrization may take place, and subsequent contractions and strictures so interfere with nutrition as to cause death.

The prognosis in the membranous (diphtheria) and pustular (variola) varieties is unfavorable. Death may also occur where extensive abscesses form or where there is great sloughing.

Treatment.— If a foreign body is present it must be removed. If the result of swallowing a corrosive substance, and the case is seen at once, the proper antidotes should be administered without delay. The diet should be soft and bland, preferably milk, and it is often advisable to nourish the patient entirely by rectal alimentation. Demulcent drinks and pledgets of ice are often grateful.

The remedies most often indicated and given in the lower dilutions, are *Acon.*, *Bell.*, *Ars.*, *Arn.*, *Hepar sulph.*, *Merc. sol.*, *Nitric acid*, *Rhus tox.*, *Silicea* and *Sulphur*.

STRICTURE OF THE ESOPHAGUS.

Synonyms.— Stenosis of Esophagus, Contraction of the Esophagus.

Etiology.— Stricture of the esophagus may be congenital or acquired, but the former is of exceedingly rare occurrence and will not be considered. Acquired stenosis is most often due to the contraction caused by cicatrices, the result of swallowing corrosive fluids, or to carcinoma. Bartholow claims that "cancerous stenoses are more frequent than all the others combined." The stricture may also be due to polypoid growths within the tube or to the external pressure of tumors, aneurysm, enlarged glands, etc.

Symptoms.— Usually the first symptom experienced is an increasing difficulty in swallowing solid food which the patient refers to a certain sub-sternal point. After a time, as the dysphagia increases, fluids require a longer time to reach the stomach, and both solids and fluids are regurgitated.

If the stricture becomes impervious, food is regurgitated as soon as swallowed, but more often some time, even two or three hours, intervenes. There are usually no other symptoms except the gradually progressing debility and emaciation.

Diagnosis.— In most cases there is little trouble in establishing the diagnosis, especially when we have the history of mechanical injury or the ingestion of corrosive fluids. Auscultation reveals the arrest of the normal sounds of the passage of food at the point of obstruction, and there is heard instead, a splashing, gurgling, cooing sound. However, the only definite means of establishing a correct diagnosis and ascertaining the degree and location of the stricture, is in the passage of a bougie. Osler gives the following directions for so doing:—

"Conical bougies attached to a flexible whale bone stem are the most satisfactory, but the gum-elastic stomach tube may be used; a large one should be tried first. The patient should be placed on a low chair, with the head well thrown back.

"The index finger of the left hand is passed far into the pharynx, and in some instances this procedure alone may determine the presence of a new growth. The bougie is passed beside the finger until it touches the posterior wall of the pharynx, then along it; more to one side than in the middle line, and so gradually pushed into the gullet. It is to be borne in mind that in passing the cricoid cartilage there is often a slight obstruction. Great gentleness should be used, as it has happened more than once that the bougie has been passed through a cancerous ulcer into the mediastinum or through a diverticulum. It is well always, as a precautionary measure before passing the bougie, to examine carefully for aneurysm, which may produce all the symptoms of organic stricture."

In case the stenosis is due to carcinoma, or aneurysm, or the pressure of tumors, etc., it is quite important that the fact be ascertained, and this, if possible, should be done before attempting the passage of the bougie. The history of the case and its clinical features will assist greatly in so doing. If the stenosis be due to spasm, we will usually find a neurotic history.

Prognosis.—As a rule the prognosis is unfavorable, though some cases respond to treatment. Strictures occurring in the upper portion of the tube are more easily cured.

Treatment.—This consists chiefly in the passage of the bougies of a very gradually increasing size, and in the use of the galvanic current or electrolysis. In bad cases the last mentioned is the only hope. I have little confidence in surgical measures. The food must necessarily be fluid, and should be as concentrated as possible. Bovinine, panopepton, milk, raw egg, etc., are to be considered. When deglutition is impossible, life must be sustained by rectal alimentation.

I have little confidence in remedies, yet they should be administered according to the general symptoms, which they may materially control even if they do not cure the stricture.

CARCINOMA OF THE ESOPHAGUS.

This is usually epithelioma. It is the most common disease of the tube, and occurs more frequently in males than females. The upper third of the tube is the common site of the disease, though Anders claims that the middle and lower third are most often involved. The mucous membrane is first involved, but ulceration rapidly supervenes, involving more or less of the tube structure, and may extend to and involve the larynx, trachea, or bronchus, and may even perforate the pleura, the pericardium, or the aorta, or one of its larger branches, and cause fatal hemorrhage. The lung may be perforated, giving rise

to local gangrene. Dilatation of the tube and hypertrophy of the circular muscular fibers usually occur above the site of the disease. Paralysis of the vocal cords may result from pressure.

Symptoms.—The earliest symptom is dysphagia from the beginning stenosis of the tube, and depends in severity upon the amount of narrowing that takes place. Usually it gradually increases until only liquids can be swallowed, and later even these are regurgitated. If the disease is located high up, regurgitation takes place at once, but if near the stomach several minutes may elapse, especially if there be any great degree of dilatation. The regurgitated food is mixed with mucus, blood, or fragments of cancerous tissue. The patient usually complains of severe burning, lancinating pains, but this is by no means a constant symptom. The usual cancerous cachexia is present and a rapidly progressive emaciation. The disease usually lasts from one to two years, death resulting from inanition, exhaustion, or as the result of the extension of the disease and consequent complications, which have already been mentioned.

Diagnosis.—This can only be established by the exclusion of other causes of stenosis, by the history, the presence of cancerous tissue in the regurgitated food, and on the bougie, and the cancerous cachexia.

Prognosis.—The prognosis is hopeless as to ultimate recovery. Remedies sometimes relieve and prolong life to a limited extent.

Treatment.—The usual methods of treating stricture of the esophagus will not apply when carcinoma is present, nor is there any mechanical or surgical treatment of value. Nourishment must be kept up even if rectal feeding become necessary. Any remedy well indicated by the subjective symptoms should be given, and may afford some relief. *Arsen.* (3x), *Carb. an.* (6x), *Iod.* (3x), *Krcos.* (3x), *Lach.* (6.), and *Phytol.* (2x), are most apt to be indicated.

V. DISEASES OF THE STOMACH.

METHODS OF DIAGNOSIS.

In order to make a correct diagnosis in diseases of the stomach, it is absolutely essential that a thorough knowledge be obtained of the character and quantity of the gastric juices, which can only be accomplished by various chemical tests. The motor power of the stomach should always be known, and this requires certain mechanical measures. To these add the physical signs obtained by the usual methods of inspection, palpation and percussion, together with the occasional aid of the microscope, and it is fairly reasonable to presume that a correct diagnosis can be established. Auscultation is of little value.

Examination of the Gastric Function.—Examination of the contents of the stomach can not be reliably made from the ordinary ejections, but only from those procured at a definite period, after a so-called test meal. The test meal most commonly employed is that of Ewald. It consists of one or two rolls, weighing together nine or ten drachms, and one cup of warm tea or water, without milk or sugar, taken after a twelve-hours' fast. At the end of one hour the stomach is emptied by means of the bulbed stomach tube, and the tests made as hereinafter described.

The microscope should be first used to detect the presence of blood or any residue from previous meals; after which the excreta should be filtered, being previously well shaken.

The following are the most practical and important qualitative tests: To determine the reaction, ordinary litmus paper is used; if acid, the blue turns red. The presence of free acids is determined by the use of Congo-red paper, which is turned blue, but is not influenced by these acids when combined with bases.

To test for free HCl only, Günzburg's phloroglucin vanillin or Boas' resorcin test is used. Günzburg's reagent consists of *phloroglucin* 30 grains, vanillin 15 grains, alcohol one fluid ounce. The solution is pale yellow, and has a decided odor of *vanilla*. On exposure to light it assumes a dark golden-yellow. It must, therefore, be kept in dark-hued bottles or freshly made as required. To two or three drops of this reagent add an equal number of the gastric filtrate in a porcelain dish, and slowly evaporate to dryness over a flame; and if free HCl is present, a rose-red tint appears along the edges, or red stripes will be observed. Blowing at the end will hasten the reaction. This test is very delicate, as is conclusively shown by its availability when HCl is present in the proportion of 1 to 20,000. The reaction is not simulated by albuminates nor interfered with by salts present in the normal proportion, nor by organic acids.

Boas' Resorcin Test.—Resublimed resorcin five parts, white sugar three parts, and diluted alcohol 100 parts. The method of procedure is the same as in Günzburg's test, and a purple-red color appears. More caution is required in evaporating, but this method will also detect the presence of free HCl in the proportion of about 1 : 20,000.

Test for Lactic Acid.—Boas' test. Digest the filtrate several times with ether to remove the fatty acids; add a few drops of phosphoric acid, and boil. Transfer the mixture to a distillate flask; add H_2SO_4 and MgO_2 ; heat, and lactic acid will be distilled over. This can be conducted into a strong alkaline solution of iodine and potassium iodide. The presence of lactic acid is then shown by the production of iodo-

form, which can be recognized by its odor, and by the precipitate that is formed.

The presence of lactic acid in the gastric contents during the first stage of digestion (formerly believed to be physiologic) is now considered to have pathologic significance. As ordinary bread contains lactic acid, the usual test meal is not employed, but instead, a thin gruel is made by adding to a quart of water flavored with salt, half an ounce of oatmeal flour. Boas states that no lactic acid is ever found in the filtrate several hours after the test meal, unless cancer is present. Lactic acid in the stomach contents results from fermentation — stagnation from either obstruction or deficient motility.

Fatty or Volatile Acids.—Heat to boiling point one or two drachms of the filtrate in a test tube, over the mouth of which place a strip of moistened blue litmus paper; the presence of fatty acids will change the paper to red.

Acetic Acid.—In large quantities this acid is detected by its odor, and in smaller quantities its presence is determined by neutralizing with sodium carbonate the watery residue of the ethereal extract, and adding neutral ferric chlorid, when a blood-red color will be struck. Quantitative estimation of certain constituents is often desirable, but is of less practical importance, and its consideration will be omitted, the reader being referred to special works on this subject.

“In the *gastric digestion* of the *albuminoids* (proteolysis) the proteids are converted into peptone. Although commenced in the stomach, this function is dependent in a greater part upon the action of the pancreatic ferment in the small intestines. Among the substances earliest engendered by this process are the *albumoses* (propeptone), whose separation may be thus effected. Add a small quantity of a saturated solution of sodium chlorid to an equal amount of gastric filtrate, and if it becomes cloudy, propeptone is present, the degree of cloudiness indicating the amount present. If the mixture does not become turbid, add a few drops of acetic acid, when it will become so in the presence of this substance, however slight the quantity. If heated, the solution becomes clear, and if allowed to cool, the propeptone precipitates and may be obtained by filtration.”

“In a later stage of the process of *Albumen* digestion, peptone is produced and its detection is easy. To a small quantity of the filtrate (the propeptone having been removed) add enough sodium or potassium hydrate to render the solution alkaline; then add a few drops of a one-per-cent solution of cupric sulphate, and, if peptone be present, a purplish color is presented.” (Anders.)

The Test for Pepsin.—In a test tube containing 1 drachm of filtrate

add a small piece of egg albumen, and keep at a temperature of about 100° F; if present, the albumen disappears in from two to six hours. If hydrochloric acid is absent from the filtrate, it is necessary to add a few drops of the dilute acid. It is very important to test for the motor functions of the stomach. The Leube test is the simplest and that usually employed. The stomach is washed out about two or two and a half hours after Ewald's test breakfast, or from six to seven hours after a large meal. The latter should consist of beef-soup (13 oz.), beef-steak ($6\frac{1}{2}$ oz.), bread ($1\frac{1}{2}$ oz.) and water ($6\frac{1}{2}$ oz.). The stomach should be found empty. If a residue remains, it indicates a lack of motor force.

The salol test of Ewald and Seivers is based upon the fact that the phenol and salicylic acid not being acted upon in an acid medium, the compound is not broken up until it reaches the intestinal tract, and is acted upon by the pancreatic juice. The salicylic acid enters the blood and is eliminated through the urine, its presence being indicated by a violet color on the addition of neutral ferric chloride. Fifteen grains of salol in thin gelatin capsules are administered, the bladder emptied, and the patient required to urinate every half hour for two hours. The salicylic acid should appear in the urine within an hour, but if the motor functions of the stomach are much impaired, it may not appear for two or more hours.

To Test the Absorptive Power.—Penzoldt's method has been almost universally adopted. A capsule containing grains $1\frac{1}{2}$ of potassium iodid is given to the patient, care being taken that the capsule is first carefully wiped. If the iodid appears in the saliva, it indicates that absorption by the stomach has taken place. To determine the presence of the iodid in the saliva, strips of starch paper are used; they are moistened with the saliva of the patient, and the moistened areas treated with a drop of fuming nitric acid. As soon as the iodid appears in the saliva, the characteristic blue reaction for starch is struck. Normally this reaction occurs in from ten to fifteen minutes; under abnormal conditions it may be delayed for half an hour or more, or it may not occur at all.

PHYSICAL EXAMINATION.

Inspection is frequently of importance. The general appearance of the patient shows the presence of emaciation, the cachexia of a malignant growth. The mouth and teeth often present indications of the presence of gastric disease.

In very thin subjects the contour of the stomach can be plainly noted; especially when there is a very large, dilated, or displaced

stomach. By inflating the stomach with air or gas the examination can be made more satisfactorily. Air is to be preferred as the supply is more easily regulated, and thus the examiner is enabled to watch the stages of distention. Air may be forced into the stomach by means of a double bulb attachment to the external end of a stomach tube. By inspection, tumors and other abdominal enlargements may sometimes be recognized. If the patient be examined in the knee-elbow position, the movable tumors will gravitate forward and can be more plainly inspected. Exaggerated peristaltic waves, epigastric pulsation and enlarged superficial veins can be detected.

The gastroscope has not proved of much practical value, neither have stomach illuminations proved as useful as had been anticipated. It is to be hoped that the Röntgen rays will yet prove of great diagnostic value in gastric diseases.

Palpation.—This furnishes at times more definite information than inspection. The patient should lie in the recumbent posture with the head low and the lower limbs partially flexed upon the abdomen and the legs upon the thighs. The examiner should stand at the right side of the patient and use the right hand. With the palmar surface flat upon the abdomen, depress the ends of the fingers as the hand is moved about. In this manner we can determine the size, shape, and position of the stomach, and can detect morbid growths and determine their consistency and movability. Sometimes, as in inspection, it is best to change the position of the patient during the examination in order to more accurately locate a morbid growth.

Palpation also elicits the degree of sensitiveness, tenderness, or pain, whether circumscribed as in ulcer or diffuse as in generalized inflammatory states. Pain is sometimes relieved by pressure and sometimes aggravated. The former usually indicates neuralgia and the latter inflammation.

Percussion.—The patient is placed in the recumbent position relaxed, for palpation. With the fingers it is possible to discriminate the slightest difference in the percussion note. A stomach empty or partially filled with gas, gives a lower tympanitic sound than does the colon filled with gas; when more distended it gives a higher pitch; when distended to a maximum, it may give a dull sound, because all vibration is stopped. Sometimes the stomach percussion note is ringing, amphoric, echoing. The presence also of liquids or solids in the stomach influences the percussion note.

The size and position of the stomach may be ascertained by percussion. The upper border of the stomach is at the ensiform cartilage, the lower about two fingers' breadth above the umbilicus; hence, if the

latter is below the umbilicus and the upper border in the normal position, it denotes an enlarged stomach. If the upper margin is some distance below the ensiform, displacement of the organ is indicated. In case the transverse colon is greatly distended with gas, thus making it difficult to accurately mark the limits of the stomach, Dehio's modification of Piorry's method may be used. This consists in giving about one quart of water in fractional doses while the patient is standing; one-quarter of the amount is swallowed and the stomach percussed. A dull note will be obtained over the most dependent portion of the stomach. A second quarter of the amount is given and the re-examination made, and so continued, the object being to ascertain to what point the lower border sinks on the addition of more fluid. Boas holds that this method tests effectively the tone of the stomach and that a *marked* descent of the lower border after each addition of water, is indubitable evidence that there exists weakness or atony of its walls.

Auscultation is of comparatively little value in diseases of the stomach.

The Stomach Pump.— Perhaps this is as appropriate a place as any to describe the stomach pump and the method of using it, either for diagnostic or therapeutic purposes. The stomach pump consists of a soft rubber tube from two fifths to three fifths of an inch in external diameter and about forty-six inches long. It may have a bulb attachment or not as desired, and may have both direct and lateral openings. The upper end is shaped into a funnel. A double channel tube for a recurrent flow is manufactured, and is very convenient. The length of tube necessary to reach the stomach in any given case can be ascertained by measuring the distance from the spinous process of the ninth vertebra, along the back, passing under the ear to the first incisor teeth. In males the length required is twenty-four inches, and in females about twenty-two inches.

To introduce the tube the patient either sits or stands facing the physician, the head bent slightly forward, and with some receptacle in front of him to hold the washings. Weak and elderly people should occupy a recumbent posture. The tube, previously dipped into warm water, is passed with a slight downward curve in the pharynx, at the mesial line. Should some contraction occur, the patient should make attempts at deglutition, when the tube will pass readily into and down the esophagus. When the penciled ring, usually present on the tube, is at the incisor teeth, the bulb will, as a rule, have passed into the stomach.

If the throat is very tender and sensitive, a cocaine spray may be previously used.

The tube should never be used when there is present serious heart disease, arterial degeneration, aortic aneurysm advanced pulmonary tuberculosis or recent hemorrhages from the stomach or lungs.

The contents of the stomach may be withdrawn by attaching a Politzer air bag or a Boas aspirator, but siphonage is sufficient. For the latter purpose, after the tube is introduced, fill it with warm water and invert the funnel over a receptacle placed below the abdomen. Gentle pressure on the abdomen will start the siphon current, or the patient is directed to contract the muscles of the abdomen as at stool, and the contents of the stomach are quickly expelled. The same general rule applies when using the tube for the purposes of lavage. About one pint of hot water (100° F.) being used at each time, the process being repeated until the water returns from the stomach clear or nearly so. Usually about one gallon of water is used at each lavage.

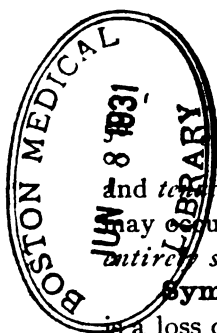
ACUTE CATARRHAL GASTRITIS.

Synonyms.—Simple Gastritis, Acute Gastric Catarrh, Acute Dyspepsia, Acute Indigestion, Gastric Fever.

Definition.—An acute catarrhal inflammation of the mucous membrane of the stomach, characterized by feverishness, loss of appetite, nausea, vomiting, painful digestion, etc.

Etiology.—Acute gastric catarrh is a very common disease. It occurs at all ages after infancy, and is more frequent in men than in women, and in persons suffering from malnutrition, anemia, gout, rheumatism, and constitutional dyscrasias. It is also more apt to occur in those suffering from chronic gastric catarrh. It is most often caused by errors of diet, insufficient mastication of food, swallowing too hot or too cold liquids, excessive eating, abuse of ices, condiments, sauces, etc., and especially of alcoholic drinks. A frequent cause is the taking of food which has begun to decompose, particularly in hot weather, such as decomposed fruit or canned goods or tainted meats. In such cases there are formed, as a result of the fermentation and putrefactive processes, acetic, lactic, and butyric acids and the ptomaines which are the immediate causes of the gastritis; and there is usually presented mild typhoid symptoms, which constitutes the so-called gastric fever. Acute gastritis frequently occurs at the beginning of infectious fevers. It may be caused by vicissitudes of temperature as during the hot days and cool nights of autumn. It may also be of mycotic origin.

Pathology.—The morbid changes are similar to those present in other catarrhal inflammations. The mucous membrane is irregularly congested and engorged, and covered with a grayish, semi-transparent



ACUTE CATARRHAL GASTRITIS.

and *tenacious mucus*, having an *alkaline* reaction. Slight hemorrhages may occur. The *true gastric juice* is secreted in *lessened amount* or is *entirely suspended*.

Symptoms.—In the milder forms, the first symptom experienced is a loss of appetite soon followed by the well-known symptoms of indigestion—malaise, dull pain, heaviness, pressure, and general discomfort at the epigastrium, headache, nausea and vomiting which usually gives relief. The vomita consists first of undigested food, then viscid mucus, acid and bitter, and finally bilious matter; the tongue is heavily coated, there is bad taste, the breath is foul, bitter or foul eructations, and usually more or less moderate febrile disturbance.

Such an attack usually terminates in about twenty-four hours. In severe cases the above symptoms are all present, but more or less intensified, the temperature rising to 102° to 103° , and other symptoms aggravated in proportion. The epigastrium is somewhat distended and tender to the touch. There is usually diarrhea. The urine is scanty, high colored, and heavy with urates. Often, especially in children, an erythematous cutaneous eruption is present. Toward the termination of the attack, which is usually in two or three days, herpetic eruptions may appear about the mouth. If the vomita be examined it will be found that the hydrochloric is absent, and lactic and fatty acids, with an excess of mucus present.

Diagnosis.—The diagnosis of the lighter forms of acute gastric catarrh is usually an easy matter, but the more severe forms so simulate the first stages of infectious disease that it is sometimes impossible to make a definite diagnosis during the first day or two, but a careful observation of the conditions during that time ought to render an error of at least rare occurrence. In children where an erythematous rash develops the case is quite often mistaken for scarlet fever. If severe headache and delirium are present at the onset, especially in children, there is a possibility that the case may be mistaken for meningitis. It, however, only requires a day or two at most before all such diseases can be excluded and a correct diagnosis be made.

Prognosis.—The prognosis is always favorable in uncomplicated cases of primary origin.

Treatment.—The first and most important point in treatment is an entire abstinence from food, the stomach requiring complete rest. In case there is reason to believe that portions of undigested food remain in the stomach, it is well to drink freely of warm water and produce emesis; or even to wash out the stomach by the usual methods. This, however, is not usually required. If troublesome vomiting is present and can not be controlled by remedies, counter-irritation may

be used over the stomach or over the tenth dorsal vertebra. A mustard plaster may answer, but equal parts of chloroform and alcohol applied on three or four layers of flannel is the best and acts the quickest. Pure water should be drunk in large quantities, but no food allowed until the tongue begins to clear and the appetite returns. Then only malted milk or peptonized milk should be given at regular intervals for two or three days, gradually increasing the diet list to mutton, chicken, and other broths, then to semi-solid food,—the lighter meats,—oysters, game, spring chicken, etc., being first allowed. Oftentimes cold food and drink is most grateful and apparently harmless. Ice cream is usually taken with impunity from the first. Vegetables and fruits must be used cautiously, and malt liquors, tea, and coffee absolutely forbidden until after the health has been fully restored. If the attack has been very severe the patient must be cautioned to be careful in eating for several weeks lest a relapse or gastric dilatation occur. The administration of the carefully selected remedy is of the greatest importance; the indications for remedies will be given later on.

TOXIC GASTRITIS.

Definition.—An intensely acute inflammation of the stomach caused by the ingestion of irritant and corrosive poisons.

Pathology.—“In the non-corrosive poisons, such as phosphorus, arsenic and antimony, the process consists of an acute degeneration of the glandular elements, and hemorrhage. In the powerful concentrated poisons the mucous membrane is extensively destroyed, and may be converted into a brownish black eschar. In the less severe grades there may be areas of necrosis surrounded by inflammatory reaction, while the submucosa is hemorrhagic and infiltrated. The process is of course more intense at the fundus, but the active peristalsis may drive the poison through the pylorus into the intestine.” (Osler.)

Symptoms.—The symptoms vary greatly according to the nature of the special poison ingested and can not be enumerated farther than to mention those common to all: intense pain in the mouth, throat and stomach, dysphagia, incessant vomiting, the vomitus being bloody and sometimes containing shreds of mucous membrane, and diarrhea, sometimes violent purging.

The abdomen is distended and the epigastrium tender and very sensitive to pressure. A condition of collapse soon supervenes, the surface becomes cold and covered with a clammy sweat, and the pulse weak and rapid. Sometimes the collapse is preceded by a rapidly rising temperature, which as rapidly descends, usually to below normal. The urine may be albuminous or bloody, and petechiæ may develop in

the skin. Gastric ulcers and stricture of the esophagus may result. Death may result from the direct effect of the poison, from the immediate shock, or from the shock and from the subsequent perforation with peritonitis. Recovery may take place provided the injury to the organ is not too extensive, and the patient reacts from the shock and consequent collapse. In such cases the pain and vomiting gradually subside, the symptoms of collapse disappear and the stomach tolerates a bland diet. However, a secondary inflammation may occur and end fatally. Recovery is necessarily slow, and often only partial, there remaining more or less extensive cicatrices, contraction of the stomach and stenoses of the orifices, according to the extent of the injury. As a result, digestion and nutrition remain more or less impaired during life.

Diagnosis.—The diagnosis depends upon the history obtained of the ingestion of a poison, the appearance of the mucous membrane of the mouth and fauces, the characteristic violent symptoms and chemical and microscopical examination of the vomitus.

Prognosis.—The prognosis depends largely upon the nature of the poison, the amount taken and the promptness and efficiency of efforts made to secure free emesis.

Treatment.—The first point is to ascertain if possible the nature of the poison ingested and then administer the appropriate antidote, having first given an emetic or used the stomach pump. To produce emesis apomorphia hypodermically is generally best. Sulphate of zinc, ipecac or mustard water may be used. The stomach should be carefully washed out. Poisoning by acids requires magnesia, which should be administered in milk or egg-albumen. Lime water, soda or common soap may be used. Poisoning by caustic alkalies require dilute acids or common vinegar. Narcotics require stimulants—strong coffee, brandy or whisky. The various mineral salts require their appropriate antidotes: arsenic, dialyzed iron, or hydrated sesquioxide of iron; antimony, vegetable astringents, as green tea, galls, and oak-bark infusion; mercury and copper, albumen and mucilaginous substances; phosphorus, turpentine, magnesia, etc.; carbolic acid, saccharated lime. Subsequent efforts must be directed toward the control of the inflammation. Ice bags are very important. Demulcent drinks should be given as freely as the conditions will allow. The pain will often require morphine. The indicated homœopathic remedy may not accomplish its usual results, but at the same time should not be neglected. Rectal alimentation must be adopted so long as severe inflammation exists.

ACUTE SUPPURATIVE GASTRITIS.

Synonym.—Phlegmonous gastritis.

Definition.—An acute inflammation of the sub-mucosa resulting either in the formation of an abscess, or a diffuse purulent infiltration of the parietes.

Etiology.—This disease occurs more often in men than in women; but is usually the result of trauma, or more often of sepsis, occurring in the course of puerperal fever or other septic processes.

Symptoms.—The symptoms vary greatly; usually there is distention of the abdomen, severe epigastric pains, high and irregular temperature, weak and irregular pulse, thirst, nausea and vomiting, the vomita sometimes containing pus cells. Typhoid symptoms supervene, great prostration, coma and death. In the circumscribed form there is sometimes a distinct tumor formed that may attain the size of a cocoanut. If death occurs it is usually within a week, otherwise the case may run a chronic or sub-acute course that usually ends fatally.

Diagnosis.—None of the symptoms occurring in phlegmonous gastritis are diagnostic, and the disease is rarely recognized. The presence of an abscess may sometimes be discovered by its rupture and the subsequent vomiting of pus, but even then, it is usually impossible to decide whether or not it is an abscess perforating into the stomach from without.

CHRONIC CATARRHAL GASTRITIS.

Synonyms.—Chronic Catarrh of the Stomach, Chronic Gastritis, Chronic Dyspepsia, Chronic Catarrhal Dyspepsia.

Definition.—A chronic inflammation of the mucous membrane of the stomach, characterized by various degrees of indigestion and impairment of the processes of assimilation and nutrition, presenting a great variety of symptoms indicative of widely different forms of gastric disturbance.

Pathology.—The most important anatomical changes occur about the pylorus. The mucous membrane is either red or of a brownish-slate color and elevated into ridges from hypertrophy, the result of constant congestion. The membrane is thick, hard and tough, and is usually covered by a thick tenacious, viscid mucus. The veins are enlarged and ecchymoses and erosions are observed. About the pylorus the mucosa presents a wrinkled, mammilated appearance, and sometimes there are small spots of superficial ulceration. Ewald describes the minute anatomy as that of a parenchymatous and interstitial inflammation, which may lead to such widespread degeneration of the glandular elements that ultimately scarcely a trace

of secreting tissue remains. These changes may affect the entire organ or be limited to portions of the stomach.

In long-standing cases there may be either a smooth, atrophied condition of the mucosa with a thinning of the stomach walls and enlargement of the cavity of the stomach, or on the other hand a hyperplasia involving the submucosa and the muscular layer causing contraction and great diminution in the size of the cavity.

Etiology.—Chronic catarrhal gastritis may succeed repeated attacks of acute catarrhal gastritis, and be induced by the same causes, long continued. The most frequent causes are: habitual and excessive use of spirituous liquors, tea, coffee, and the free use of ice-water during and between meals; improperly prepared and unsuitable food; irregularity of meals and imperfect mastication; excessive tobacco chewing; malaria; disease of the heart, lungs, pleura, liver or kidneys, producing chronic congestion of the stomachic vessels; cancerous or other degenerative diseases of the stomach.

Symptoms.—The manifold symptoms of indigestion, varying greatly in intensity, but persistently present, are due largely to a deficient secretion of the gastric juice, the result of the anatomical changes in the gastric tubules.

If there be a lack of free hydrochloric acid, the function of which is to destroy ferment-producing spores, there is consequent fermentation with its products, and resulting aggravation and prolongation of the disease. A large amount of mucus present may, by its alkalinity, partially neutralize the hydrochloric acid, and thus also be a factor in allowing excessive fermentation. It may also so completely cover, more or less, the ingesta that the gastric juices can not reach them, and, therefore, digestion is much more tardy than normal. Should the motor functions of the stomach be impaired, these conditions are greatly increased. The food may be retained for hours in an alkaline medium, where it undergoes maceration and fermentation, which is particularly liable to develop large volumes of carbonic-acid and marsh gas, which are periodically belched up with such force as to carry out the acrid fluid, and even particles of disintegrated food, producing a bitter and nauseous taste in the mouth.

Loss of appetite is one of the first symptoms, though sometimes it is not present. In all cases, to a greater or less extent, the patient after eating, in from a few minutes to an hour, experiences a feeling of fullness, oppression and distress in the epigastrium; burning, gnawing pains; tenderness at the epigastrium, which may also be present when the stomach is empty; eructations of gas; regurgitation of fluid, either acid (heartburn) due to the presence of organic or hydrochloric acid,

or a bitter form of peptones (Anders); nausea and vomiting of undigested food, or if the stomach is empty, of colorless fluid. A colorless, watery fluid vomited in the morning is characteristic of chronic gastritis due to alcoholic liquors. The tongue is coated, often with red tip and margins, sometimes broad and flabby, and the patient complains of a bad taste, or a persistently bitter taste in the mouth. The decomposing gases cause more or less distention of the abdomen. Digestion is greatly retarded, portions of food remaining in the stomach long after the normal time for complete digestion to have occurred. This may be ascertained by washing out the stomach or from the vomita. The chemical examination of the matters vomited shows the presence of acid salts, or the abnormal acids, lactic or butyric, while if hydrochloric acid is present at all it is much reduced in quantity. Should it be desired to pursue the methods of diagnosis laid down in a previous article, it should be remembered that in chronic gastric catarrh the quantity of hydrochloric acid is diminished. The consequences of this diminution may be partly modified by the presence of organic acids—lactic, butyric, and acetic, though this is not usually the case. Ewald has subdivided all cases of chronic gastritis into three varieties: (a) *simple gastritis*, in which the fasting stomach contains only a small quantity of slimy fluid, while after the test breakfast the HCl is diminished in quantity, and lactic acid and the fatty acids are usually present; (b) *mucous gastritis*, in which class the acidity is always slight and the condition is distinguished from simple gastritis by the large amount of mucus present. (c) *atrophy*. Here the fasting stomach is always empty, while after the test-breakfast HCl, pepsin and the curdling ferments are wholly wanting.

In chronic catarrhal gastritis the bowels are usually constipated, the urine high-colored and containing an excess of phosphates or urates, usually the latter, the former being present in cases where the nervous element predominates. In some cases diarrhea is present with undigested stools. There is always more or less headache, vertigo, depression of spirits, amounting in some cases to melancholia, physical indisposition, languor, drowsiness after meals but persistent sleeplessness at night, bad dreams, and many nervous symptoms due to sympathetic disturbances.

Diagnosis.—The diagnosis is often obscure and attended with difficulty. It is sometimes at least no easy matter to distinguish between catarrhal and atonic dyspepsia, between catarrhal and neurotic conditions, or to differentiate from gastric ulcer, cancer or dilatation. The differential diagnosis in these conditions will be given later on. However, a plain, etiological history and a careful study of the symptoms,

together with the methods of diagnosis detailed in a preceding article, will be found all-sufficient to establish a positive diagnosis.

Prognosis.—The prognosis as to a radical cure, especially in cases of long standing, is not favorable, but under proper treatment and *régime* the conditions can be greatly improved and a fair degree of health insured. Mild cases taken early are often cured. If associated with one of the various forms of organic disease, to which reference has already been made, or with organic complications of the stomach due to the disease itself, the prognosis is quite unfavorable.

Treatment.—*Diet* and *Hygiene* are of the utmost importance, and if neglected, medicines are of comparatively little avail. Meals should be eaten regularly and slowly, plenty of time being allowed for mastication. In very mild cases it may be sufficient to simply eliminate from the diet obviously indigestible foods such as pies, griddle cakes, pickles, fried foods, rich cheese, etc., and saccharine and farinaceous articles; but in most cases a cure can not be accomplished until a strict regimen is enforced. It is not possible to establish a dietary that will avail in all cases. A wise physician must discriminate, allowing for individual peculiarities and idiosyncrasies. What may agree with one may not with another, and yet the same general rule of dietetic treatment may apply,—a change only being required in certain articles of food. Severe cases, and especially those complicated with nephritic or cardiac disease, do best on an exclusive milk diet, which should be kept up for several weeks. Two or three quarts of milk a day can be given in quantities of from one fourth to one half a pint at regular intervals. It is best taken hot, but can be used moderately cold if more agreeable to the patient. Boiled milk is objectionable. Thompson recommends that the milk be diluted with soda water or an alkali, such as sodium bicarbonate or magnesia, and salt should be added. If the thirst is very great, as is often the case with alcoholics, the milk may be diluted with a carbonated water. If the milk seems too rich, or causes nausea or loathing, or is not easily digested, it should be skimmed, or butter-milk substituted.

In most cases where pure milk does not agree, cereal foods may answer a good purpose. In bad cases, and where the mucous secretion is unusually excessive, peptonized or pancreatinized milk, or bovine, liquid peptonoids, panopepton or other similar food may be used. The milk diet may gradually be supplemented by such foods. Scraped meat and peptonized meat, white meat of chicken, quail, squirrel, etc. are good to start in with, and indeed no stronger meats should be allowed for a long time. The meal should be either fluid or solid, one or the other. When mixed the fluid dilutes the feeble gastric juice too

much for the proper digestion of the solids. Therefore no broth or soup should be allowed with meals. Oysters, either raw, broiled or panned, fish, eggs, stale or twice-baked bread may be allowed. Butter is the only form of fat allowable. Rich gravies and sauces must be forbidden. In cases where there is an excess of HCl, lean roast beef or rare beefsteak may be allowed. In a great many cases smoked meats and some kinds of salted fish seem to digest easier than fresh meat. I have long been in the habit of allowing codfish "picked up" in milk before any other solid food. Ordinary dried beef cut in thin slices and eaten raw is easily digested. Niemyer explains this on the plausible grounds that these preparations are less likely to decompose and cause abnormal fermentation. Saccharine and farinaceous foods are to be avoided as they are most sure to create lactic and butyric acid fermentation. As the condition improves, farinaceous food thoroughly cooked and plain vegetables, such as green peas, green beans, rice, spinach, celery, asparagus and lettuce may be permitted with caution. Arrow-root, sago, the cereals (except oatmeal), vermicelli and macaroni may be selected. Stewed fruits and baked apples generally agree and act well on the bowels. Plain, well-baked white bread is better than "brown" bread, graham bread, etc. The dessert, if any, should be either junket or custard or plain rice pudding sweetened with saccharine. Patients should not be allowed to drink with their meals, or at least, required to be very moderate. "Cambric tea" or very weak Japan tea or cocoa, all without sugar, may be allowed. Cold drinks with meals are injurious. Alcoholic drinks except perhaps very light wines in moderation, should be absolutely forbidden. Drinking a glass of hot water before meals is a deservedly popular remedy in catarrhal dyspepsia. It serves to separate the layers of viscid mucus from the orifices of the gastric tubules. Tobacco in all forms must be absolutely prohibited.

Hygienic measures are next in importance to diet. Plenty of fresh air and sunshine with moderate pleasurable exercise is very desirable, but should never be carried to the point of undue exposure or great fatigue. The bicycle, used with common sense, is one of the best adjuvants we have in treating dyspepsia. Horseback riding, boating and walking are beneficial, but should not be indulged in immediately after eating or when the stomach is entirely empty. Travel, especially a sea-voyage, with the consequent change of air and scenery, is often very beneficial.

Lavage of the stomach every morning for the purpose of removing the viscid mucus is very desirable. "If there is much mucus a one-per-cent salt solution, or a three-per-cent solution of bicarbonate of soda

may be used; and if there is much butyric or lactic acid fermentation, a two-per-cent solution of salicylic acid or of resorcin will be of service. Whichever solution is introduced into the stomach, should be allowed to remain there from two to five minutes, and then withdrawn. After lavage, a spray of a three-per-cent solution of menthol in liquid alboline introduced by means of the intragastric spray apparatus, or the ordinary spray apparatus inserted into the stomach-tube, will prove beneficial in many cases. Douching the stomach, or internal irrigation with water under high pressure is often of great value. It is best accomplished by the use of the recurrent gastric needle spray or douche tube, and the single or double force irrigator. In the absence of the latter apparatus the required pressure may be obtained by simply elevating the funnel into which the water is poured, three or more feet above the cardia. The forcing of the water through the tube under high pressure produces an intragastric shower, the liquid striking the stomach walls with considerable impetus. By using a douche with hot and cold water alternating, a so-called intragastric massage may be carried on. In the various types of motor insufficiency, intragastric douches with rapidly alternating cold and warm water, improve muscular tonicity, and also exert a powerful and stimulating effect on the secretion when it is defective. In atrophic gastritis, with fermentation and stagnation, irrigation with a 4 to 5 : 1000 hydrochloric-acid solution, after the stomach has been washed out with a warm, saline solution, is of great service.

“Douching with a one-per-cent salt solution has been found to increase the production of hydrochloric acid, while douching with a four-per-cent solution of salt has been found to check the secretion of the acid; hence the value of intragastric irrigation with the latter solution in hyperacidity.” (Prof. J. R. Kippax.)

External massage of the stomach, performed two hours after meals is sometimes of great value. A cold sponge bath followed by brisk friction of the skin is advisable.

I find, as a rule, great benefit is obtained from the administration of pepsin before and after meals, especially when there is indigestion of nitrogenous foods, and which does not in the least interfere with homœopathic medication. I much prefer Fairchild's essence above all other pepsin preparations. Many of the preparations of pepsin on the market are utterly worthless. If pure pepsin be given, it should be combined with hydrochloric acid. In atonic forms hydrochloric acid may be taken, about 10 drops in a glass of water half an hour after eating. Hale prefers papoid. I have often found it very efficacious in all forms of indigestion. Peptenzyme is a most valuable all-around digestant. The malt diastase is often very serviceable.

THERAPEUTICS OF THE VARIOUS FORMS OF GASTRITIS.

Acute Catarrhal Gastritis.—*Acon.*, *Antim. crud.*, *Ars.*, *Bell.*, *Bism.*, *Bry.*, *Canth.*, *Cham.*, *Cinch.*, *Cupr.*, *Euphorb.*, *Graph.*, *Ipec.*, *Iris*, *Kali chlor.*, *Lycop.*, *Merc. sol.*, *Merc. cor.*, *Natr. mur.*, *Nux v.*, *Ox. ac.*, *Phos.*, *Podo.*, *Puls.*, *Sab.*, *Sang.*, *Sulph.*, *Ver. alb.*, *Ver. vir.*, *Zinc.*, *Zing.*

Toxic Gastritis.—*Acon.*, *Bell.*, *Ars.*, *Canth.*, *Cupr.*, *Ipec.*, *Iris*, *Merc. sol.*, *Merc. cor.*, *Natr. mur.*, *Nux v.*, *Ox. ac.*, *Phos.*, *Sulph.*, *Zinc.*

Acute Suppurative Gastritis.—*Apis*, *Ars.*, *Bell.*, *Merc. sol.*, *Hepar sulph.*, *Sil.*, *Sulph.*

Chronic Catarrhal Gastritis.—*Abies can.*, *Abies nig.*, *Absinth.*, *Acet. ac.*, *Aesc.*, *Æthusa*, *Agar.*, *Alet.*, *Alum.*, *Antim. crud.*, *Arg. nit.*, *Arn.*, *Ars.*, *Asar.*, *Asaf.*, *Ascl. tub.*, *Bapt.*, *Bism.*, *Bry.*, *Calc. carb.*, *Calc. phos.*, *Carb. ac.*, *Caps.*, *Carb. an.*, *Carb. Veg.*, *Caust.*, *Cham.*, *Chel.*, *Chin. sulph.*, *Cinch.*, *Coccul.*, *Colch.*, *Collin.*, *Con.*, *Crotal.*, *Cycl.*, *Dios.*, *Ferr.*, *Ferr. phos.*, *Fluor. ac.*, *Gamb.*, *Graph.*, *Hep. s.*, *Hydras.*, *Ign.*, *Iod.*, *Ipec.*, *Kali bichrom.*, *Kali brom.*, *Kali carb.*, *Kali nit.*, *Kreos.*, *Lach.*, *Lac. ac.*, *Lith.*, *Lob.*, *Lycop.*, *Magn. carb.*, *Merc. sol.*, *Natr. ars.*, *Natr. carb.*, *Natr. sulph.*, *Nitr. ac.*, *Nux m.*, *Nux vom.*, *Petrol.*, *Phos.*, *Phos. ac.*, *Podo.*, *Ptelea*, *Puls.*, *Robin.*, *Rumex*, *Ruta*, *Sang.*, *Sep.*, *Sulph.*, *Sulph. ac.*, *Ver. alb.*, *Zinc.*

The following are the chief indications for a few of the most important remedies:—

Abies nigra (2x).—This little used remedy is valuable in chronic dyspepsia. Low spirited, loss of appetite, pain after eating as from an undigested hard boiled egg, sleepy during the day, wakeful and restless at night, with bad dreams. Dyspepsia from the use of tea or tobacco.

Aconite (3x).—Acute gastritis: characteristic temperature and pulse, great anxiety and restlessness.

Antim. crud. (6x).—Either acute or chronic gastritis characterized by an excessive secretion of mucus, with a depressed, torpid state of the mucosa, rather than an irritated, inflamed condition. A mucous flux without fever. A milky white coating on the tongue is most characteristic, also loathing of food and continual nausea and tendency to vomit. From overloading the stomach from fat and indigestible foods, sweet things, sour wines, etc.

Arsenicum (3x).—All forms of gastritis. Burning pains with anguish; painful distention; nausea and vomiting, excited by eating or

drinking; vomiting of ingesta; of brown substance; of mucus; of blood and mucus; weight as from a stone; great thirst, drinks often but little at a time; grave cases, characterized by great exhaustion, and rapid sinking of strength, even collapse. An excellent remedy in persons who have enfeebled the stomach by the persistent use of ice-cold drinks, tobacco, and excesses of various kinds, and whose nervous system gives evidence of great exhaustion.

Argentum nitricum (6x to 30x).—Like Arsenicum, useful when there exists much irritation of the mucous membrane. There is excessive flatulence; the stomach seems ready to burst; copious eructations, which are accomplished only after persistent effort and are very violent, fluid seems to run right through the entire alimentary canal without stopping. Gnawing ulcerative pain at the pit of the stomach, radiating in every direction; pain worse from even the least plain food. Longing for sugar. The patient is in a condition of apathy; the mental symptoms are of great importance, and consist of marked depression, great anxiety and worry.

Belladonna (3x).—First stages of acute forms of gastritis with characteristic bounding pulse and high temperature; particularly in children or plethoric subjects; violent throbbing, cutting, drawing, wrenching pains; great sensitiveness of stomach to touch.

Bismuth (2x).—Chronic gastritis. Great distress, weight and pressure after eating, which seems to extend back to the spine; nausea and vomiting after eating; when occurring during the course of chronic organic diseases, schirrhus, etc. Bismuth subgallate is recommended by Goodno in five or ten grain doses before meals when there is great fermentation and decomposition of food.

Bryonia (3x to 30x).—Acute, subacute and chronic gastritis. Tongue thickly coated white; dryness of mouth and lips; pain and sensitiveness in epigastrium; bitter taste; nausea and vomiting; characteristic constipation.

Carbo. veg. (6x to 30x).—An excellent remedy in various forms of dyspepsia where putridity is the essential feature; low type, resulting from dissipation, excessive indulgence in rich foods, luxurious wines, etc., especially after Nux vom. has failed. Great flatulence; aversion to meat, fat food and milk, the latter always causing flatulence; constant acrid eructations; heartburn; sensitiveness and *burning* in stomach. Gastritis resulting from salt or salt meats; from putrid meat or fish or rancid fats. Pronounced temporary chemical effect may often be obtained by giving crude charcoal tablets.

Cinchona (3x).—Like Lycopodium, Cinchona is oftenest indicated when flatulence predominates, and a small quantity of food seems to fill

him full; the abdomen is distended with gas, and there is a desire to belch it up, but the eructations do not relieve; desire for acids and fruits, but they only increase the fermentation; heavy pressure in stomach; slow digestion; food remaining long in stomach; milk disagrees; cold feeling in stomach; weak and drowsy after meals. Chronic gastritis in children.

Ferrum (6x).—Dyspepsia of anemic patients; usually a voracious appetite, or else the patient feels full and has no appetite; considerable flatulence; can not eat, because it produces vomiting and sometimes diarrhea.

Ignatia (3x to 30x).—Dyspepsia of nervous origin; eructation and hiccough after eating; desire for indigestible food; weak, empty, sinking feeling in stomach, better from eating; frequent deep sighing; melancholia; hysteria.

Ipecac (3x).—Gastric catarrh from indigestible food, especially rich food, pastry, pork, etc., or from ice-cold food or drinks; tongue coated white or perfectly clean tongue; distressing feeling, as though the stomach were hanging down relaxed, constant nausea and inclination to vomit.

Kreosotum (3x).—Bitter, acrid, fetid risings and eructations; great fermentation and distention; extreme burning pains; vomiting of food; gastritis associated with phthisis or cancer.

Lachesis (6).—Intolerance of clothing about the waist; variable appetite; painless gnawing when stomach is empty, relieved by eating.

Lactic acid (3x).—Food sours; hot, acrid eructations, which burn from the stomach to the mouth, water brash, nausea and vomiting.

Lycopodium (6x).—Great flatulence; excessive hunger, but a small quantity of food fills him up; acrid eructations; incomplete and burning hiccough; sour taste extending to stomach, causing acrid gnawings; dyspepsia from farinaceous foods, from onions. Chronic cases in patients with liver and gouty troubles.

Merc. cor. (3x).—Acute gastritis. Intense burning pains; distension and soreness of epigastrium; unquenchable thirst; violence of all symptoms.

Natrum carb. (6x).—Acid dyspepsia, especially marked after vegetable diet, starchy food, with hypochondriasis and palpitation of the heart.

Nux moschata (3x to 30x).—Dyspepsia from overtaxing the mind; enormous distention of the stomach and abdomen after meals; can only digest highly seasoned foods; worse from any motion; constant sleepiness; from reflex irritation; nervous, hysterical women.

Nux vomica (3x to 30x).—The most often indicated and most

useful remedy in all forms of gastritis. This is largely due to the peculiar effects of Nux upon the nervous system, giving rise to a long train of symptoms indicating disordered digestion of such a character as usually arises from long-continued errors in diet, irregular habits, close confinement, overexertion of the mind, loss of sleep and debauchery. In persons who are so engrossed in business that they pay little attention to their physical requirements, until their nervous system is completely broken down, and they become hypochondriacal and have gastric and abdominal complaints, constipation and hemorrhoids. Tongue coated thick white, worse mornings; bad taste in the morning; dull, frontal headache in the morning; sallow complexion; bitter, sour eructations; hiccough; heartburn; nausea in morning; vomiting of mucus or of food and bile; bloatedness; heaviness and pressure an hour or two after eating, always worse after eating, especially a hearty meal; irritable and cross.

Pulsatilla (3x to 30x).—Gastric catarrh, dyspepsia and indigestion in general, characterized by putrid, slimy, greasy or bitter taste after eating or in the morning; tongue coated thick white or yellow; loss of appetite; vertigo; bitter or rancid eructations; continual nausea and qualmsiness; regurgitation of food; pain and weight in stomach; sensation as if the food had lodged under the sternum; especially aggravated by fat foods. Dyspepsia from ice cream, etc., ice water, fruit, buckwheat cakes, fat food.

Sepia (30x).—To be consulted whenever women suffer from menstrual or uterine difficulties; sour, putrid taste; aversion to meat; desire for sour things; emptiness in the stomach, with anguish; palpitations; weakness and weariness of legs; sour eructations; the sweat of the axillæ and feet exhales a very strong odor.

Sulphur (30x).—Chronic gastritis in characteristic sulphur patients who have a constitutional dyscrasia.

It is especially useful in people who are subject to eruptions upon the skin, and those in whom the skin is rough and harsh and the hair coarse; light-complexioned; lean, stoop-shouldered; offensive odor from the body; general dislike to, and aggravation from, washing or bathing. Said to be indicated for people who have very red lips, and redness of the other orifices of the body, often accompanied by soreness and burning. Arouses the reactive energies of the system when carefully selected remedies have failed to produce a favorable effect. Like *Lycopodium*, there is ravenous hunger, but a little food satisfies; empty, gone, faint feeling about 11 A. M.; milk disagrees; heartburn; acid vomiting.

NERVOUS DYSPEPSIA.

Definition.—Nervous dyspepsia includes all forms of functional disturbances of the stomach due to nervous influences, and without local lesion.

Etiology.—The causes are purely nervous, and most cases occur in highly nervous organizations, in persons who are very emotional or hysterical; in such, any trifling nervous influence, such as shock or excitement, may induce an attack. The use of alcohol or tobacco are common causes of nervous dyspepsia.

Symptoms.—Nervous dyspepsia is characterized by distress and uneasiness during digestion, eructations, heartburn, etc., but the process is not delayed, the stomach being found empty after a test meal within the physiological time limit. There is usually considerable epigastric distention but no tenderness, hard pressure affording relief rather than pain. A variety of mental and nervous symptoms attend such cases and are sufficiently plain as to indicate the real cause of the disorder. Leube recognizes three chief types. (1) Nervous dyspepsia with normal secretion. (2) Nervous dyspepsia with subacidity. (3) Nervous dyspepsia with hyperacidity. Outside of the presence or absence of acid secretion as shown by the intense acid eructations in the last-named variety and by the usual chemical tests, the symptoms are practically the same. There are various other neuroses of the stomach that may be briefly considered at this time, since they are mostly only symptoms of diverse nervous disorders, and so far as they affect the digestion may appropriately be considered as symptoms of nervous dyspepsia. These are due (1) to an increased peristalsis of the stomach, and (2) to a decreased peristalsis of the stomach. To the first class belong (a) *belching and eructations*, such as are met with in nervous, hysterical subjects and neurasthenics. The gas is expelled with more or less noise, and is odorless, wherein it differs from gases that result from fermentation. (b) *Pyrosis*, consisting of acid regurgitations causing intense burning, the stomach contents not being necessarily acid. (c) *Rumination*, or *Merycismus*, where the patients regurgitate the food into the mouth and chew the cud like ruminants. It occurs in neurasthenic or hysterical persons, epileptics and idiots. (d) *Nervous vomiting*. This is not due or connected with any organic stomach disease, but arises solely from nervous influences acting upon the centers that preside over the act of vomiting. It mostly occurs in hysterical women, and the attacks have no relation to the meals or to the stage of digestion, though perhaps occurring more often after eating. It is more a regurgitation than vomiting, there being no nausea. Occasionally these

cases eventually prove fatal. (e) *Peristaltic unrest*. This is a common and distressing symptom in neurasthenia, the patient feeling the peristalsis during digestion, just as a nervous person may feel the beating of his own heart.

The second class of neuroses due to a diminished peristalsis are (a) *atonic dyspepsia*. A purely nervous condition, and consists of a hypomotility or insufficiency. There are no organic changes as in catarrhal dyspepsia, though it may be associated with that disease. It differs from purely nervous dyspepsia in that the lack of motility retards digestion, and chyme is found on examining the stomach six or seven hours after Leube's test meal. There is usually eructations of gas, impaired appetite, oppression, and often constipation. (b) *Pyloric relaxation or incompetency*. A rare condition, that "allows the partially digested gastric contents to pass the portals of the stomach prematurely. It likewise permits the regurgitation of the contents of the duodenum into the stomach. Its recognition is possible upon inflating the stomach, when gas may be seen to pass into the intestines, and also (even with greater certainty) upon the regurgitation of intestinal contents into the stomach. (c) *Cardiac relaxation*. This condition leads to eructations and regurgitations, and when these are of aggravated form they impair the general nutrition. Ordinarily this state of affairs runs for years without marked ill effects." (Anders).

Diagnosis.—The diagnosis of nervous dyspepsia and allied conditions is only made by excluding all those palpable signs and symptoms, indications of stomach lesions, including the results of chemical tests as explained when considering chronic catarrhal gastritis. This done, and having present the neurotic element, neurasthenia, hysteria, etc., a diagnosis is usually made without difficulty. The course of the disease is chronic and it may terminate in chronic gastric catarrh.

Prognosis.—This depends entirely upon the possibility of removing the mental and nervous influences that are at the seat of the trouble. Often this can not be accomplished, and frequently when the health seems to be restored, there comes a return of the symptoms. In many cases the patient can not be made to believe but that he is suffering from a serious and hopeless malady.

Treatment.—If it is possible to discover the cause and remove the same by any means whatsoever, this must be done. In many cases the treatment is largely mental, and the resources of the physician are taxed to meet the peculiarities of the individual case. As a rule cheerfulness and encouragement without making light of the patient's sufferings is important. Ordinarily the diet should be generous and nutritious, and the patient taught to believe that she is entirely capable of digest-

ing it. In obstinate cases forcible feeding or gavage may be necessary. This is accomplished with a stomach tube, the technique being the same as in lavage. This procedure is usually necessary only in hysterical anorexia, or in those where the mental state is such that they have imbued the idea that in order to recover they must absolutely desist from taking food into the stomach. In some cases S. Wier Mitchell's treatment of forced feeding is advisable. In nearly all cases, not only for the actual benefit obtained, but also for the mental effects upon the patient, it is well to employ electricity, occasional lavage, hot and cold douches and gastric massage. In using electricity the galvanic and faradic currents should be employed. The galvanic should be used over the stomach and spine and the faradic over the muscles and limbs.

The remedies required belong mostly to that class usually indicated in hysteria — Asaf., Ignat., Coccul., etc., but the remedies given under chronic gastritis may be consulted,—*Nux vomica* being especially useful in hypochondriacs. As a rule, in this disease remedies act better in moderately high dilutions.

GASTRALGIA.

Synonyms.—Cardialgia, Gastrodynia, Neuralgia of the Stomach.

Definition.—Severe paroxysmal pain in the epigastrium without local disease, although a form of neuralgia of the stomach it may be associated with and caused by cancer or ulcer, which will not be here considered.

Etiology.—This affection belongs to the group of neuralgiæ occurring as a manifestation of a functional neurosis independent of organic disease. It is usually associated with other nervous symptoms, most cases occurring in highly emotional and hysterical subjects, and from such exciting causes as grief, anxiety, passion or anticipated pleasure. Occurring as it sometimes does, in connection with chronic nervous disease, it constitutes the so-called "gastric crises." Gastralgia may also occur during the course of various organic diseases, especially gastric ulcer and carcinoma and such other organic diseases as are prone to give rise to neuralgias of other parts.

Symptoms.—Normal gastric digestion is present, the gastric secretions being unchanged, and examination after a test meal shows the stomach to be empty within the normal time-limit. The patient may suffer some of the most common symptoms of nervous dyspepsia, such as anorexia, hyperexia, epigastric distress and oppression after meals, regurgitation of food, heartburn and vomiting. The chief feature of gastralgia is its paroxysmal character. Romberg thus describes an attack:—

"Suddenly, or after a feeling of pressure at the precordium, there is severe *gripping pain* in the stomach, usually extending to the back, with a *feeling of faintness*, a shrunken countenance, cold hands and feet, and an *intermittent pulse*. The *pain* becomes so excessive that the patient cries out. The *epigastrium* is either *puffed out*, like a ball, or *retracted*, with tension of the abdominal walls. There is often *pulsation in the epigastrium*. External pressure is well borne, and not unfrequently the patient presses the pit of the stomach against some firm substance, or compresses it with his hands. *Sympathetic pains* often occur in the thorax, under the sternum, and in the esophageal branches of the pneumogastric, while they are rare in the exterior of the body."

"The attack lasts from a few minutes to half an hour or longer; then the pain gradually subsides, leaving the patient much exhausted; or else it ceases suddenly, with eructation of gas or watery fluid, or with vomiting, and with a gentle, soft perspiration, or with a passage of reddish urine."

Nervous symptoms of a manifold character are always present. Except in those cases where nervous dyspepsia is present, the general health as a rule does not suffer, but in such the general nutrition may be impaired.

Diagnosis.—It is often difficult to exclude gastralgia that occurs in connection with chronic organic disease of the nervous system, as in locomotor ataxia, and especially that associated with gastric cancer or ulcer. In such, the history of the case is of great importance, not only as to the physical signs and symptoms manifest of organic disease but also as to a proper estimation of the neurotic element as an etiological factor. In the article on gastric ulcer will be found a differential table of considerable value. From gastric catarrh the differentiation is more easy. Not only does analysis of the gastric contents after a test meal exclude that disease, but in gastralgia the symptoms do not occur after a meal and are not aggravated by eating, even of indigestible food, but are rather relieved thereby, and are less constant in their presence than are those of gastric catarrh, there being usually more or less prolonged intervals between the attacks. There is some danger of confounding gastralgia with gallstone colic, but the difference in location of the pain, the absence of jaundice and other characteristics of gallstone should be sufficient for diagnostic purposes.

Prognosis —The prognosis as to a radical cure is unfavorable, the attacks being prone to return from time to time, especially in neurotic subjects, even after an apparent cure. Much depends upon the char-

acter and extent of the nervous ailments. Mental cases are most unpromising. The prognosis as to life is always favorable.

Treatment.—The general treatment is essentially the same as that recommended for nervous dyspepsia and the indications for remedies there given may be consulted. The remedies most often required are: *Anac.*, *Argent. nit.*, *Ars.*, *Bell.*, *Bism.*, *Calc. c.*, *Cham.*, *Chin. ars.*, *Coccul.*, *Coloc.*, *Cupr.*, *Ignatia*, *Lach.*, *Nuxvom.*, *Phos.*, *Plat.*, *Plumb.*, *Puls.*, *Ver. alb.* I prefer all these remedies in the lower dilutions. Electricity is undoubtedly a valuable agent here as in other neuroses. Rockwell recommends a faradic current of high tension in cases where from pressure over the seat of pain relief is obtained, and galvanism when pressure increases the pain. He recommends electrodes of plastic sculptor's clay, placing the anode over the seat of pain.

DILATATION OF THE STOMACH.

Definition.—An abnormal increase in the size and capacity of the cavity of the stomach, and may be either acute or chronic.

Etiology.—Acute dilatation rarely occurs, though it may result from the rapid ingestion of food or drink, or from drinking quantities of effervescing liquids or to paralytic distention due to chronic gastric catarrh. Pyloric stenosis is the chief factor in the causation of chronic dilatation. This may result from many causes, operating to decrease the caliber of the pyloric orifice, or there may be a congenital stenosis. Of the former, carcinoma either of the stomach, or of adjacent organs, is most common. Sometimes the stenosis results from the pressure of an enlarged gall-bladder, from a displaced right kidney or from thickening, due to the action of corrosive poisons. It may also be due to inflammatory adhesions about the pylorus.

With any of these conditions present the stomach is required to exert more than normal force to propel the food into the duodenum. This results in hypertrophy of the muscular coat, and later in degenerative changes. Weakness of the muscle takes place, and the motor force of the stomach becomes so impaired that more or less of the ingesta remains in the stomach, undergoing fermentation and putrefaction, giving rise to catarrhal conditions, and, finally, to a gradually increasing dilatation. The latter is usually general, involving alike the entire organ, though if there are erosions or ulcers, diverticula may occur at those points. Dilatation occurring from such causes may be very great. Loomis records one case where the stomach was so enormously dilated as to be capable of containing ninety pounds of fluid.

A comparatively moderate dilatation may occur without any sten-

osis of the pylorus, the muscular coats becoming weakened from various causes, more especially from overeating and the drinking of large quantities of fluids, as in the case of inordinate beer-drinkers, or in those suffering from diabetes. Chronic gastric catarrh may cause weakness of the muscular coats and lead to dilatation. Nutritional disturbances and various degenerations, especially fatty, due to constitutional disease, such as tuberculosis or anemia, may cause atony of the muscular walls, or the same may occur from an impaired condition of the nervous system.

Symptoms.—The symptoms vary greatly, but, as a rule, may be said to include those of the disease producing the obstruction, if pyloric stenosis is present, plus those of obstinate chronic gastric catarrh with a characteristic vomiting. Owing to the increased capacity of the stomach, far beyond its digestive power, large accumulations take place, resulting in the vomiting at intervals of enormous quantities of liquids and of food, but at no time is the stomach entirely emptied. The ejecta are usually small, sour, and excessively acrid and offensive. Fermentative changes take place rapidly, forming lactic, butyric, and acetic acids and sulphureted and phosphureted hydrogen gases. On standing it separates into three layers, the lowest consisting of food, the middle of a turbid, dark-gray fluid, and the uppermost of a brownish froth. The microscopical examination shows a large variety of bacteria, yeast fungi, and the *sarcina ventriculi*. Pyrosis and eructations of foul gases are of common occurrence. Not infrequently the patient suffers with cramps in the calves of the legs, and sometimes, also, in the flexors of the arms, and in the abdominal muscles, and in rare cases tetany is present. On account of the small amount of fluid reaching the intestines, and the small amount absorbed by the stomach, there is constipation, the feces being hard and dry, scanty urine and dry skin.

Inspection shows an abnormal prominence of the whole region, or of the epigastric region, the greatest projection being in the pyloric region. Sometimes the outline of the distended stomach is plainly seen, and this may be accomplished at any time by having the patient take a large effervescent drink. Palpation reveals the peristalsis, the tumor at the pylorus (if stenosis be present), a peculiar air-cushion elasticity and a peculiar splashing sound is heard upon tapping with the fingers. The latter can be caused by the patient depressing the diaphragm or by rapid bodily movements. If the stomach be nearly empty, percussion will reveal a tympanitic note to several inches below the umbilicus. If the stomach be filled, either with the food and liquids ingested, or artificially with water, a dull sound is obtained where tympanic reso-

nance had before been found, the line of dullness changing with a change of position of the patient. In cases of doubt, the size of the stomach may be obtained by filling it with carbonic acid gas, having the patient first drink a little water containing a teaspoonful of bicarbonate of soda, followed by the same quantity of Tartaric acid. All methods of measurements are inaccurate and often misleading, but a hard sound or probang is often used for that purpose. In cases of dilatation, it will sometimes pass as far as 28 inches beyond the teeth instead of the normal 24 inches. Auscultation reveals splashing, sizzling and rumbling sounds, and the succussion sound is readily heard if the body is shaken.

Diagnosis.—The methods of securing positive evidences of dilatation have already been enumerated, which together with the copious vomiting at intervals and the character of the ejecta, ought to be sufficient to make a diagnosis comparatively easy.

Prognosis.—Acute cases usually recover, but may merge into the chronic form. In the latter the prognosis is invariably unfavorable when pyloric stenosis, either simple or cancerous, exists. Where stenosis is not present, there is some prospect of accomplishing a cure.

Treatment.—Daily lavage is a most important and necessary feature of treatment. The stomach must be kept empty and clean so far as possible. How to do this has already been detailed under chronic gastritis. So long as fermentative changes are taking place a three-per-cent solution of boracic acid should be used, but later lukewarm is better. Alternate hot and cold douches by means of a double stomach irrigator are of great value. The diet should be chiefly of fluids, or small quantities of tender meat taken at frequent intervals. Fatty and starchy foods must be avoided. *Electricity* may do much to assist in overcoming the parietic conditions present. Surgical measures are sometimes resorted to, but with little avail.

The appropriate remedy will depend entirely upon the symptoms, and as these are largely those of chronic gastric catarrh, the remedies there detailed may be consulted. *Nux vom.* (3x) is the remedy in a large majority of cases. *Strychnia* is the drug universally recommended and employed by the old school. *Ars.* (3x), *Bry.* (3x), *Carbo. an.* (6x), *Carbo. veg.* (6x), and *Sulphur* (30x) are also often required.

GASTRIC ULCER.

Synonyms.— Simple or Round Ulcer, Perforating Ulcer, Peptic Ulcer.

Definition.— A well-defined ulcer involving the mucous membrane of the stomach with a tendency to extend in depth and invade one or more layers of which the walls of the stomach are composed. It is sometimes described in connection with ulcer of the duodenum of which it is a counterpart.

Pathology.— Gastric ulcers are usually solitary, though they may be multiple. The posterior wall near the pylorus in the vicinity of the lesser curvature is its most frequent location. The usual shape is round or oval; the edges are well-defined, the walls slope inward, giving a funnel-shaped appearance; the floor is usually clean and free from inflammatory changes, and the size varies from one half an inch in diameter to four inches. The depth varies, the ulcer sometimes involving only the mucous coat, at other times extending to the deeper structures and even perforating the stomach wall. The mucous membrane of the stomach shows almost regularly the lesions of a subacute or chronic catarrhal gastritis. Often the ulcer heals spontaneously before all the coats are perforated, leaving a distinct cicatrix to mark the location, though where the mucosa alone is involved, the margins may unite and leave a smooth scar. If the ulcer be centrally located, it may cause what are known as girdle contractions and give the stomach an hour glass shape. The ulcer may extend in depth until perforation of the stomach wall takes place, the gastric contents entering the peritoneal cavity and causing a rapidly fatal peritonitis. Perforation is more common with ulcers of the anterior than with those of the posterior wall, for the reason that protective adhesions to other organs do not so readily form. These adhesions may form between the stomach and the surrounding viscera, especially the left lobe of the liver, the pancreas, and the omental tissues. Extension of the ulceration and secondary infection of pus microbes may lead to fistulous tracts and suppurating cavities in these adhering organs. Gastro-intestinal fistulæ are thus formed, and perforation into the pleura, the pericardium, and the left ventricle of the heart has been known to occur. The suppurative process may extend along the veins, causing a suppurative pyelophlebitis with multiple abscesses in the liver. The adhesions may not be extensive enough to prevent perforation, but may suffice to shut the site of rupture from the general peritoneal cavity, so that a localized peritoneal abscess results. Perforation of the posterior wall produces an air-containing abscess in the lesser peritoneal cavity, known as "subphrenic pyopneumothorax."

One of the most unfortunate effects of a gastric ulcer is the erosion of a blood vessel which is of common occurrence. This accident may occur with recent acute ulcers, but it is more common in the chronic form with spreading ulceration. Ulcers on the posterior wall of the stomach may erode the splenic artery or the artery of the lesser curve.

Etiology.—The causes of gastric ulcer are not definitely known. Ewald attributes it mainly to an “altered composition of the blood, and the resulting insufficient nourishment of the cells.” Riegel claims that the ulcer is due to a self-digestion of the stomach at a limited spot, and it is certainly more than a coincidence that in ulcer the gastric juice is always hyperacid. Virchow claims that *emboli* or *thrombi* form in the nutrient gastric arteries which have lost their tonicity, an ulcer forming at the point of obstruction. Gastric ulcer is more frequent in women than in men, and in the poor rather than the rich. It more often occurs in those whose occupation requires them to sit bent over, as in tailors, shoemakers, weavers, and needle women. In such cases Rasmussen holds that the ulcer is due to pressure on the stomach, which induces atrophy and anemia of the mucosa, particularly near the smaller curvature. Anemia, chlorosis and menstrual disorders are considered potent factors. Tuberculosis gives rise to gastric ulcer in some cases, though such ulcers do not always present the features of a tuberculous abscess. No doubt gastric ulcer is often the result of gastritis.

Symptoms.—The distinctive symptoms of gastric ulcer are pain, tenderness, vomiting and hematemesis.

In addition to these we may have any or all of the symptoms of chronic gastritis, either in a modified form or of the most intense character. Pain is the most constant symptom. It is of a burning, gnawing character, is located in the epigastrium, often running through to the back, being in fact a paroxysm of intense gastralgia. It is always localized within a circumscribed area. It ordinarily occurs soon after eating, and ceases when the stomach is relieved of its contents by the normal process of digestion, by vomiting or by artificial means. In some cases the pain comes on in attacks at intervals for weeks or months, and then the patient goes for a long time without attacks; the pain, however, returns after a variable length of time. It is usually relieved by pressure, and greatly ameliorated by absolute rest. Tenderness is nearly always present, usually over a limited area an inch or so below the ensiform cartilage. Vomiting is almost as common as pain, coming on soon after eating if the ulcer is at the cardiac orifice, an hour or so after if it is located at or near the pylorus. Rejected matter may be undigested or partly digested food, or simply acrid mucus. The proteids are usually digested, but the starches remain

unchanged. There are usually no evidences of fermentation, though the ejecta generally contain more than the normal quantity of HCl.

Hematemesis occurs in about half the cases. It may be slight, but more often is very profuse, of a bright red color and more or less clotted. The vomiting of a large quantity of unaltered blood is very characteristic and of great diagnostic value. If the vomiting of blood is less profuse, it may have gradually accumulated in the stomach and become mixed with the stomach contents, until, from the action of the gastric juice, the ejecta present the appearance of coffee grounds. As a result chiefly of the loss of blood, a more or less pronounced anemia may result. Sudden profuse hemorrhage may cause syncope and death. In some cases some blood, and in rare cases all the blood, passes the pylorus and is evacuated with the stools, giving them a black, tarry appearance.

Course.—The course of gastric ulcer is usually slow, lasting for one or two years, though it may, in rare cases, be limited to a few hours, or extend over a period of ten or even twenty years. The following clinical forms as described by Welch illustrate the wide variations in the character and course of gastric ulcer:—

“1. Latent ulcers, with entire absence of symptoms, and revealed as open ulcers, or as cicatrices at the autopsy.

“2. Acute perforating ulcers. With or without a period of brief gastric disturbance, perforation occurs and causes speedy death.

“3. Acute hemorrhagic form of gastric ulcer. After a latent or a brief course of the ulcer, profuse gastrorrhagia occurs, which may terminate fatally, or may be followed by the symptoms of chronic ulcer.

“4. Gastralgic-dyspeptic form. In this, which is the most common form of gastric ulcer, gastralgia, dyspepsia and vomiting are the symptoms. Sometimes one of the symptoms predominates greatly over the others, so that Lebert distinguishes separately a gastralgic, a dyspeptic, and a vomitive variety. Gastralgia is the most frequent symptom.

“5. Chronic hemorrhagic form. Gastrorrhagia is a marked symptom, and occurs usually in combination with the symptoms just mentioned.

“6. Cachetic form. This usually corresponds only to the final stage of one of the preceding forms, but the cachexia may develop so rapidly and become so marked that the course of the disease closely resembles that of gastric cancer.

“7. Recurrent form. In this, the symptoms of gastric ulcer disappear, and then follow intervals, often of considerable duration, in which there is apparent cure, but the symptoms return, especially after some indiscretion in the mode of living. This intermittent course may

continue for many years. In these cases it is probable either that fresh ulcers form or that the cicatrix of an old ulcer becomes ulcerated.

"8. Stenotic form. By the formation of cicatricial tissue in and around the ulcer, the pyloric orifice becomes obstructed and the symptoms of dilatation of the stomach develop."

Diagnosis.—Typical cases presenting the characteristic pain, tenderness and hematemesis, are easily recognized. Paroxysms of gastralgia with hematemesis are almost pathognomonic. In cases where there is no hemorrhage, the diagnosis is more obscure, and must be determined by the pain, tenderness, hyperacidity and other symptoms already mentioned. Gastric ulcer is most liable to be confounded with chronic gastric catarrh, gastric carcinoma and gastralgia. The chief points of differentiation between it and the two former will be given in the next article on gastric carcinoma. The following table from Anders gives the differential points between gastric ulcer and gastralgia:—

Gastric Ulcer.	Gastralgia.
The paroxysms of pain usually come on at a definite period after eating.	Paroxysms more frequent when the stomach is empty than soon after meals.
Eating rarely relieves pain.	Eating usually brings relief.
Tenderness on pressure over a certain limited area in the epigastrium.	Tender spot absent. General hyperesthesia of the skin often present.
Pressure usually aggravates, and only occasionally relieves patient during paroxysm of pain—not during the intervals between seizures.	Pressure almost always relieves the pain.
In the intervals between the attacks gastric disturbances, more or less severe, are present; also tender point frequently.	In the intervals between attacks no gastric disturbances present, as a rule.
Hematemesis present in nearly one half of the cases.	Hematemesis absent.
General health often much impaired, particularly late in the affection.	General health less affected than in ulcer.
History of certain occupations, anemia, chlorosis, amenorrhea, tuberculosis, and diseases of the heart common.	History of neurasthenia, neuralgia, and hysteria common.
Most frequent from fifteen to thirty-five years of age.	Most frequent before or near the menopause (in the female).
Physical signs of a mass may be present.	Signs of tumor always absent.
Dilatation may coexist in the late stage.	Dilatation never present.
Hyperacidity of gastric juice usually present.	Hyperacidity present only in certain forms (supra).
Improvement follows rest and regulation of diet.	Regulation of diet has no effect.

Prognosis.—The prognosis is uncertain. Post-mortems show that many gastric ulcers heal completely. In many cases their presence had never been suspected, and no treatment for gastric ulcer had ever been instituted. Fatal hemorrhage or perforation may occur at any time. Relapses are frequent. Recent ulcers are more amenable to treatment than an old indurated one. A remaining cicatrix may cause gastritis, neuralgia or stenosis with consequent dilatation, and render further curé next to impossible.

Treatment.—Absolute rest in bed is of the utmost importance, and there is little hope of cure without it. In severe cases the patient may need to spend several months in the recumbent posture. In milder chronic cases the rest cure may be somewhat modified. The regulation of the diet is of equal importance. In severe cases the stomach must be given complete rest, especially after a hemorrhage, the patient being nourished by rectal feeding. In less severe cases rectal feeding and direct alimentation may be daily alternated, or made to supplement each other. In all cases where food is taken, it should be bland, easily digested, and taken in small quantities at frequent intervals; liquids and predigested foods are best. Malted milk, peptonized milk, koumiss, buttermilk or matzoon are desirable foods. Da Costa found that ice-cream gave unexpected relief in some cases. If the milk preparations do not answer in any individual case, the various prepared meat juices may be used. Valentine's and others, bovine or malted meat, beef peptonoids, trophosphine or panopepton. Other patients may be fed upon egg albumen beaten and sweetened or prepared with sherry wine, or the yolk of an egg may be beaten in an ounce of boiling water and added to a tumbler of milk. Less serious cases may be allowed such articles as zwieback or stale bread crumbs or cracker crumbs soaked in milk until quite soft. They will prevent the formation of large coagulæ of milk. Any change in quantity or variety of diet should only be made with great caution. As improvement follows, the diet may be gradually enlarged, allowing the patient to have soft-boiled eggs, rice, sweet breads, scraped beef, young chicken, tender game and farinaceous puddings. Coarse cereals, alcoholic liquors and aerated waters should be at all times forbidden. Warm applications over the stomach are often grateful. Lavage is of great value, especially when the pain and vomiting are intense and uncontrollable. For hematemesis a broad, flat ice-bag should be used, and cracked ice given internally.

Therapeutics.—As many of the general symptoms in gastric ulcer arise from the associated gastric catarrh the remedies recommended for the latter disease may be consulted. As a rule Arsen., Arg. nit., Bell. (atropin), Bism., Phos., Conium. and Secal. cor. are most often

required for gastric ulcer, their probable comparative importance being in the order named. *Arsen.* (3x) is no doubt the chief remedy, as its symptoms more closely correspond to gastric ulcer than do those of any other remedy unless it be *Arg. nit.* (2x). These remedies have also a close pathogenetic resemblance to gastric ulcer. *Arsenicum* is indicated by violent burning pains in the stomach, vomiting of blood, stomach sore to the touch, great distress in epigastrium, characteristic thirst. *Argent. nit.* is most useful where there are symptoms of acute inflammation of the stomach, with much pain, retching and vomiting. The secretion of HCl is said to be lessened by the use of this drug. With the same class of symptoms, but with copious urine added, *Uranium nit.* (1x) may be the remedy. *Merc. cor.* (3x) is frequently useful when the symptoms are intense, the abdomen bloated, tender and painful, great burning, extending up the esophagus, vomiting. *Atropin* (6x) is especially useful for the gastralgic paroxysms. It is often used empirically with evident good results. *Bismuth* (2x) also covers the usual symptoms. It is very universally used by the old school. I use it in the 2x, but it is more often prescribed in the crude form, from one to thirty grains at a dose, which I consider unnecessary. The indications for the use of Bismuth are: Pressure as from a stone in one spot; pressing, burning pain from the stomach through to the back; relief from cold drink; when the stomach becomes full, the contents are all vomited up. *Phos.* is no doubt a valuable remedy, both from a symptomatic and pathological standpoint. *Lycopodium* or *Hydrastis* may be indicated and are often useful. With the exception of *Bismuth* it is better to prescribe all the above remedies in the higher potencies, certainly not lower than the 6x. *Kali bichrom.* (3x) gives a round, deep ulcer in its pathogenesis, and also covers many of the symptoms common to gastric ulcer. *Ipecac* (3x) should be given for profuse, bright hemorrhages. When the latter is dark like coffee-grounds *Secale* (3x) or *Conium* (3x) should be consulted; if dark and clotted *Hamam.* (Tincture). Consult article on Hematemesis.

CARCINOMA OF THE STOMACH.

Varieties.—The usual subdivision of gastric carcinoma is as follows: (1) Hard cancer, or scirrhus. (2) Soft cancer, or encephaloid, or medullary. (3) Epithelioma. (4) Colloid. Anders only gives two subdivisions: columnar epithelial (including colloid) and the glandular carcinomata, embracing scirrhus and encephaloid. The latter may be the more scientific, but the former is more practical and will be adhered to in this article. There is a difference of opinion as to their relative frequency, though all agree that the colloid variety is least common.

Pathology.—With the exception of the uterus, the stomach is the most frequent seat of primary carcinoma. It is almost always primary and in from sixty to eighty per cent of cases it is located at the pylorus. As a rule, cancer begins in the tubules rapidly extending to the adjacent tissues, causing thickening as it progresses, and remaining as a hard, nodulated mass, or ulceration takes place which may result in hemorrhage or perforation. The latter is not frequent. In about four per cent of cases perforation into the peritoneum, and less often into the colon, or through the abdominal wall, or fistulæ may be formed into the lungs, the pleura and the small intestine. When adhesions form, as they frequently do, very extensive ulceration may take place without perforation, especially into the peritoneum. Ulceration is most frequent in the epithelioma and encephaloid cancers, and less often in the scirrhus and colloid varieties. Cancer at the pylorus usually gives rise to stenosis and sometimes consequent gastric dilatation. Scirrhus causes great contraction and thickening of the stomach walls. The position of the stomach is also sometimes greatly altered, it being found in almost every conceivable location in the abdominal cavity. Chronic gastritis is almost invariably present. Secondary growths frequently occur in adjacent organs, either by direct extension or by diffuse infiltration through the lymphatic glands in the immediate neighborhood. Next to the lymphatic glands in frequency metastasis occurs in the liver, the peritoneum, the omentum, the intestines, and least often in the pleura and the lungs. The special peculiarities in growth of each variety may be described as follows:—

Scirrhus cancer usually occurs as a hard, circumscribed tumor, though there may be only a general thickening of the walls. It always presents a hard feel, and is ordinarily located at the pylorus where it causes stenosis. There is little tendency to ulcerate. Microscopically it consists of hard fibrous stroma with small alveoli, comparatively few in number.

Encephaloid cancer occurs in cauliflower growths projecting from the walls, is always of rapid growth and easily ulcerates. It is soft, contains much blood, and presents either a grayish-white or reddish-white color. The microscope shows a few stroma, these inclosing numerous alveoli filled with polyhedral and cylindrical cells. Metastases are of frequent occurrence.

Epithelioma is somewhat harder than encephaloid. This is especially noticeable at the edges. The cauliflower appearance is not so marked. This variety also ulcerates easily and metastases are common. The microscope shows abundant stroma and columnar epithelium inclosed in tubular spaces, this giving a resemblance to the structure of tubular glands.

Colloid cancer is one where one of the previous forms has undergone colloid degeneration. It presents a uniform infiltration and consequent thickening of the gastric walls. In some cases lobulated masses of a tolerably firm consistence are found. It is quite prone to extend to adjacent organs and structures, though a true metastasis is rare. The microscope shows alveoli filled with the colloid substance. The latter is translucent and glistening in appearance, colorless or a grayish-yellow, and is of a glue-like consistence. This variety is sometimes termed "alveolar cancer." All these varieties may be found mixed in the same case.

Etiology.—The causes of carcinoma are unknown. It occurs somewhat more often in men than women, and rarely under thirty years of age. Heredity has but little influence. Traumatism and previous gastric disease such as chronic gastritis and ulcer have little to do with the causation of cancer, though it must be admitted that they may have some influence, as chronic gastritis has preceded some cases, and typical growths of epithelium have been found in the scars of gastric ulcers.

Symptoms.—Carcinoma of the stomach is insidious in its development, manifesting at first only symptoms of indigestion, with marked acidity, flatulence, and a fetid breath. These gradually assume a more aggravated character, until the characteristic symptoms of cancer are plainly developed, though in rare cases, especially in old people, pain is absent. Pain occurs in about ninety-two per cent of cases, and is usually described as dull and heavy, though sometimes dull and lancinating. Burning, gnawing pains are often present and are presumed to arise from secondary ulceration. The pain may be referred to the epigastrium, or between the scapulæ, but its locality is no indication of the seat of the cancer. It is almost constant, worse at times, but never approaching the severe paroxysms of gastric neuralgia. It is worse from food, but not in the same proportion, as in gastric ulcer or catarrh. There is more or less tenderness over the seat of the growth, but this is much less marked and less sharply localized than in gastric ulcer. The majority of cases have vomiting, occurring immediately after eating, if at the cardiac orifice, and some hours after if at the pylorus; if much dilatation of the stomach develop, the vomiting occurs some days after eating. The rejected matter is food in various stages of digestion, associated frequently with black grumous masses of altered blood and tissues. Hemorrhage is frequent, rarely profuse, usually oozing of blood altered into a dark brown or black color—"coffee-ground" vomit. This character of vomitus is not pathognomonic of gastric cancer as it may occur in other gastric affections. Absence of

HCl in the stomach is very characteristic and of great diagnostic importance. It is only present in rare cases associated with gastric ulcer, and while its absence may be due to other causes, its presence is strong presumptive evidence that carcinoma does not exist. Lactic acid is present quite often, due to the absence of HCl and the consequent stagnation and fermentation of food. Constitutional symptoms develop progressively with the local disease. Marked anemia, emaciation and loss of strength are present, the characteristic cachexia, or earthy, waxy color of the skin gradually developing. The action of the heart is feeble, the pulse small, weak and quick, the respiration somewhat hurried. Edema of the ankles is present, and may progress to a general anasarca. In about three fourths of the cases physical examination reveals a tumor, usually in the epigastric region, though it may have changed the position of the stomach and thus appear outside the normal boundaries of that organ, the weight of the tumor sometimes dragging the pylorus downward as far as the iliac region. Such tumors are usually located at the pylorus or in the anterior wall. When occurring at the fundus or posterior wall, they are found with difficulty except they be of very large size. When located at the cardia they can not be detected by a physical examination. If the patient is much emaciated or has a dilated stomach, the outlines of the tumor are more or less clearly outlined by inspection. Palpation usually reveals the growth as an irregular, hard, nodular mass, but this is not always the case. It is always sensitive and painful on pressure. Examination may be made with the patient lying down, with the knees drawn up so as to relax the abdominal wall; in doubtful cases examination in the knee-chest position may be more satisfactory. Gas may sometimes be felt bubbling through the tumor when at the pylorus, and communicated pulsation from the aorta is often observed. Inflation of the stomach with gas, as described in a previous article, will often bring the tumor within reach. Colloid cancers show no tumor, but the stomach wall feels abnormally thick and resistant. As the carcinoma progresses the lymphatic glands enlarge, particularly the supraclavicular and inguinal, and this is a feature of great diagnostic value. Metastases in the liver are of no infrequent occurrence, and often mask the primary disease. The liver becomes enlarged, with pain, tenderness and jaundice. Occasionally metastases in the peritoneum occurs, and may give rise to ascites. The urine often contains traces of albumen. The average duration of carcinoma of the stomach is eighteen months. Seldom do cases last over two years, except in scirrhus, when the progress may be much slower.

Diagnosis.—In many cases where a tumor is found, a diagnosis is

made without difficulty, but it is not uncommon to find cases where a positive diagnosis is impossible. The presence of the characteristic symptoms heretofore mentioned—pain, coffee-ground vomit, constant absence of HCl, presence of lactic acid, emaciation, and above all cachexia, is sufficient for diagnostic purposes in many instances. It is possible for a gastric carcinoma to be mistaken for aneurysms of the aorta, for carcinoma of the pancreas, or of the left lobe of the liver, or of the transverse colon, duodenum or omentum. In aneurysm there is an absence of the nodular-like appearance of the tumor such as is found in a cancerous growth, and the characteristic expansile pulsation synchronous with the first heart sound is present. The cancerous cachexia, and the pronounced emaciation and anemia of cancer are absent. In *carcinoma of the pancreas* the tumor is fixed, there is an absence of the "coffee-ground" vomit, there is no dilatation of the stomach, and free HCl is found in the gastric contents. There is also often present fat in both the stool and urine, though more especially in the former.

Gastric ulcer and chronic gastritis are so often confounded with carcinoma that several valuable differential tables have been prepared. The following from Welch will be found very practical and of great value:—

Gastric Cancer.	Gastric Ulcer.	Chronic Catarrhal Gastritis.
1. Tumor is present in three fourths of the cases.	1. Tumor rare.	1. No tumor.
2. Rare under forty years of age.	2. May occur at any age after childhood. (Over one half of the cases under forty years of age.	2. May occur at any age.
3. Average duration about one year; rarely over two years.	3. Duration indefinite; may be for several years.	3. Duration indefinite.
4. Gastric hemorrhage frequent, but rarely profuse; most common in the cachectic stage.	4. Gastric hemorrhage less frequent than in cancer, but oftener profuse; not uncommon when the general health is but little impaired.	4. Gastric hemorrhage rare.
5. Vomiting often has the peculiarities of that of dilatation of the stomach.	5. Vomiting rarely referable to dilatation of the stomach, and then only in a late stage of the disease.	5. Vomiting may or may not be present.
6. Free hydrochloric acid usually absent from the gastric contents in cancerous dilatation of the stomach.	6. Free hydrochloric acid usually present in the gastric contents.	6. Free hydrochloric acid may be present or absent.

7. Cancerous fragments may be found in the washings from the stomach or in the vomit (rare).

7. Absent.

7. Absent.

8. Secondary cancers may be recognized in the liver, the peritoneum, the lymphatic glands, and rarely in other parts of the body.

8. Absent.

8. Absent.

9. Loss of flesh and strength and development of cachexia, usually more marked and more rapid than in ulcer or in gastritis, and less explicable by the gastric symptoms.

9. Cachectic appearance, usually less marked and of later occurrence than in cancer, and more manifestly dependent upon the gastric disorders.

9. When uncomplicated, usually no appearance of cachexia.

10. Epigastric pain is often more continuous, less dependent upon taking food, less relieved by vomiting, and less localized than in ulcer.

10. Pain is often more paroxysmal, more influenced by taking food, oftener relieved by vomiting, and more sharply localized than in cancer.

10. The pain or distress induced by taking food is usually less severe than in cancer or ulcer. Fixed point of tenderness usually absent.

11. Causation not known.

11. Causation not known.

11. Often referable to some known cause, such as abuse of alcohol, gormandizing, and certain diseases, as phthisis, Bright's disease, cirrhosis of the liver, etc.

12. No improvement, or only temporary improvement, in the course of the disease.

12. Sometimes a history of one or more previous similar attacks. The course may be irregular and intermittent. Usually marked improvement by regulation of diet.

12. May be a history of previous similar attacks. More amenable to regulation of diet than is cancer.

Prognosis.—The prognosis as to cure is absolutely hopeless. Death occurs in from one to two years, either from exhaustion, peritonitis or hemorrhage.

Treatment.—Carcinoma of the stomach is incurable though cases are reported as having been cured by Condurango, Arsenic, Acetic acid, etc. It is altogether likely that in all cases so reported there was a mistake in diagnosis. However, much can be done by a strict attention to diet and the administration of the indicated remedy to relieve the patient's sufferings and prolong life. Where the suffering is intense,

the use of opium in some form is perfectly justifiable and from a humanitarian standpoint can not be avoided. Probably the best sedative is morphine, combining $\frac{1}{8}$ of a grain with five grains each of bicarbonate of soda and subnitrate of bismuth. No regular diet can be recommended. The patient should be allowed to eat such articles of food as are largely digested and assimilated in the intestines. As a general rule predigested liquid foods are most desirable. Some patients do best on malted or peptonized milk. In case the stomach rejects all food, rectal alimentation must be resorted to. Washing out the stomach is very important, but the introduction of the tube should be practiced with great care. If the growth be localized and no adhesions to other organs, or secondary growths be present, surgical interference by resection or gastro-enterostomy or even gastrotomy may be justifiable. The therapeutics are symptomatic and palliative only. Often symptoms of gastric catarrh or ulcer largely prevail, for which the indicated remedy must be given and will often afford relief. *Arsenicum* (3x to 30x) is the remedy most often indicated and is probably more useful than any other. Arndt has found *Ars. iod.* 3x "capable of doing much good." He says: "It controls gastric pain, aids digestion, exerts a favorable effect upon the anemic condition, lessens the utter prostration of the vital forces, and appears to make its kindly influence felt in every direction." When the acidity and fetor of the breath is very marked *Carbolic acid* (2x), *Kreos* (2x) and *Carbo. an.* (6x) are best. *Phosphorus* (3x) is often indicated. *Lapis alb.* has been used empirically with some benefit. *Hydrastis* is often useful, the hydrochlorate being highly recommended. It is claimed that *Hydrastis* has cured some cases. Dilute HCl. is said to be useful in the early stages, to be given five drops in one-third glass of water every fifteen minutes for one hour after eating. Acetic acid 1x was strongly recommended by William Owens.

HEMATEMESIS.

Synonyms.—Gastric Hemorrhage, Hemorrhage of the Stomach, Gastrorrhagia.

Etiology.—Hemorrhage of the stomach may occur as a symptom of a great variety of diseases, both local and general, and as such it will be considered in the appropriate places. It may be well, however, to enumerate under one heading the respective conditions by which it may be caused. Osler classifies them as follows:—

"1. In local disease in the stomach itself: (a) Cancer; (b) ulcer; (c) disease of the blood vessels, such as miliary aneurysms of the smaller arteries, and occasionally varicose veins; (d) acute congestion, as in

gastritis, and possibly in vicarious hemorrhage, but both of these are extremely rare causes.

"2. Passive congestion due to obstruction in the portal system. This may be either (a) hepatic, as in cirrhosis of the liver, thrombosis of the portal vein, or pressure upon the portal vein by tumor, and secondarily in cases of chronic disease of the heart and lungs; (b) splenic. Gastrorrhagia is by no means an uncommon symptom in enlarged spleen, and is explained by the intimate relations which exist between the vasa brevia and the splenic circulation."

"3. Toxic: (a) the poisons of the specific fevers, smallpox, measles, yellow fever; (b) poisons of unknown origin, as in acute yellow atrophy and in purpura; (c) phosphorus."

"4. Traumatism: (a) mechanical injuries, such as blows and wounds, and occasionally by the stomach-tube; (b) the result of severe corrosive poisons."

"5. Certain constitutional diseases: (a) Hemophilia; (b) profound anemias, whether idiopathic or due to splenic enlargements or to malaria; (c) cholemia."

"6. In certain nervous affections, particularly hysteria and occasionally in progressive paralysis of the insane and epilepsy."

"7. The blood may not come from the stomach, but flow into it. Thus it may pass from the nose or the pharynx. In hemoptysis some of the blood may find its way into the stomach. The bleeding may take place from the esophagus and trickle into the stomach, from which it is ejected. This occurs in the case of rupture of aneurysm and of the esophageal varices. A child may draw blood with the milk from the mother's breast, even in considerable quantities, and then vomit it."

"8. Miscellaneous causes: Aneurysm of the aorta or of its branches may rupture into the stomach. There are instances in which a patient has a simple attack of hemorrhage without even having a recurrence, or without symptoms pointing to disease of the stomach. In newborn infants hematemesis may occur alone or in connection with bleeding from other mucous membranes."

"In medical practice, hemorrhage from the stomach occurs most frequently in connection with cirrhosis of the liver and ulcer of the stomach. It is more frequent in women than in men, owing to the greater prevalence of round ulcer in the former."

Symptoms.—Hemorrhage and consequent anemia are the most important. The subjective symptoms accompanying a gastric hemorrhage are a sensation of warmth in the stomach, nausea and faintness with sinking feeling at the pit of the stomach. This is followed by the ejection of blood, which is usually black or has a coffee-ground appear-

ance. In case of profuse hemorrhage, the blood may be bright red, the gastric juice not having had time to act upon it. Sometimes if the hemorrhage be large, the blood may all pass through the bowels and none be vomited. In severe cases death may occur before any blood passes either way. Often the blood comes up with a gush and is carried into the larynx, inducing a paroxysm of coughing, which gives the erroneous impression that it has been coughed up from the lungs. The amount of blood lost may vary from a very small quantity to two or three pounds, or even more, within twenty-four hours. The symptoms of anemia are in proportion to the amount of blood lost. A singular peculiarity is the development of an incurable amaurosis, which has never yet been satisfactorily explained.

Diagnosis.—First of all it is necessary to ascertain by inspection, and if necessary by appropriate tests, if it is blood that is passed. Then the cause must be determined, which can best be accomplished by a process of exclusion, the diagnosis being established according to the conditions and rules elsewhere considered under the respective diseases named as etiological factors in gastric hemorrhage. The diagnosis between hematemesis and hemoptysis is often quite difficult. Welch gives the following differential table:—

Hemoptysis.

1. Usually preceded by symptoms of pulmonary or cardiac disease. Bronchial hemorrhage without evidence of preceding disease is not rare.
2. The attack begins with a tickling sensation in the throat or behind the sternum. The blood is raised by coughing. Vomiting, if it occurs at all, follows the act of coughing.
3. The blood is bright red, fluid or but slightly coagulated, alkaline, frothy, and frequently mixed with muco-pus. If the blood has remained some time in the bronchi or in a cavity, it becomes dark and coagulated.
4. The attack is usually accompanied and followed by localized moist râles in the chest, and there may be other physical signs of pulmonary or cardiac disease. Bloody sputum continues for some time, often for days, after the profuse hemorrhage ceases.

Hematemesis.

1. Usually preceded by symptoms of gastric or hepatic disease, less frequently by symptoms of other diseases.
2. The attack begins with a feeling of fullness in the stomach, followed by nausea. The blood is expelled by vomiting, to which cough, if it occurs, is secondary.
3. The blood is dark, often black and grumous, sometimes acid, and usually mixed with the food and other contents of the stomach. If the blood is vomited at once after its effusion, it is bright red and alkaline; or it may be alkaline if it is effused into an empty stomach.
4. After the attack the physical examination of the lungs is usually negative, but there are generally symptoms and signs of gastric or hepatic disease. Black stools follow profuse hematemesis.

Prognosis.—This depends entirely upon the cause. Except where there is a rupture of an aneurysm gastric hemorrhage seldom proves fatal, though it may do so when resulting from cirrhosis, splenic enlargement or gastric ulcer, in which case death may result from anemia and exhaustion consequent upon repeated attacks or from the immediate consequence of a profuse hemorrhage.

Treatment.—Absolute rest in bed is imperative. The spirits of the patient should be maintained by encouraging words. A broad, flat ice-bag should be applied over the stomach, a spinal ice-bag along the spine and cracked ice given internally. No food should be allowed for several days in most cases, the strength being sustained by rectal alimentation. As a hemostatic *Erigeron* is probably the best (see Therapeutics). Gallic acid (grs. x) or alum may also be used if a styptic is considered necessary. If the hemorrhage has been copious, a normal salt solution (one teaspoonful of salt to a pint of water) may be injected into a vein. According to Stewart, in *Hare's System of Therapeutics* "not over a half or three quarters of a pint should be introduced at first. When a recurrence of the hemorrhage is feared, more can be used later, should the urgency of the symptoms again demand it. The solution should be made with boiled, preferably distilled water. It must be of the body temperature and is readily introduced, all that is required being a small glass canula, a piece of rubber tubing and a funnel. The fluid might be injected into the cellular tissue, preferably between the scapulæ, in place of a vein. The resulting benefit would be as great though not so promptly produced, and the danger, that of sudden raising of vascular tension, would be largely obviated.

Therapeutics.—Hale bases his treatment upon an accurate diagnosis and recommends the following: "If from ulcer of the stomach, arsenic, turpentine, sulphuric acid, *erigeron*, *thaspium*, nitrate of silver, bismuth and resorcin. If from varicosis, ergot, *hamamelis*, *carduus*, *collinsonia*, *hydrastis*, millefoil and sulphuric acid. If from obstruction in the portal system, *mercurius*, *chelidonium*, *carduus*, *ononimin*, aurum, phosphorus and mercury. If from injuries, *arnica*, *bellis*, sulphuric acid, *erigeron*, and millefoil. If from splenic disease, china, *ceanothus*, *arnica*, and arsenic. If from congestion, *veratrum viride*, aconite, phenacetin, and aurum. If from cancer, bismuth, charcoal, antipyrin, arsenic, and persulphate of iron."

To base the treatment of any disease entirely upon the diagnosis is not according to the principles of homœopathy, and will often lead to error. To use styptics in hemorrhage from any part is often admissible, but a homœopathic prescription should be based solely on the totality of the symptoms. From this standpoint the following remedies

are to be considered: *Acet. ac.*, *Acon.*, *Arn.*, *Ars.*, *Cinch.*, *Crocus.*, *Crotal.*, *Erig.*, *Ferr.*, *Ham.*, *Ipec.*, *Kreos.*, *Lach.*, *Millef.*, *Nux v.*, *Phos.*, *Sulph. ac.*, *Tereb.*, *Trill.*

Ipecac (2x).—Of the above remedies it is altogether probable that Ipecac is most often indicated and of greatest value. The blood is bright red, there is great faintness, oppressed breathing, and persistent nausea.

Phosphorus (6x) is especially useful in persons of a hemorrhagic diathesis; passive hemorrhage; fluid and non-coagulable blood; mingled with mucus; black; like coffee-grounds; temporarily better from drinking cold water.

Arsenicum (3x) quite useful in cases of cancer or ulcer in the stomach, with hemorrhage recurring from time to time; constant nausea and retching; roaring in the head; faintness; cold face and collapsed features; burning at the stomach; great thirst, wants to drink water often and a little at a time; quick, thread-like pulse; trembling anxiety; stitching pain in the spleen.

Secale (2x).—This drug is almost universally recommended by the old school in physiological doses hypodermically, on account of its power to contract the arterial coats, diminishing their caliber and thus reducing their current of blood. Homœopathically it is indicated for passive hemorrhage; blood is fluid, does not coagulate easily, and is of a very offensive odor; great prostration of the patient; he lies still; no pain. Face, lips, tongue, and hands deathly pale; abdomen cold and soft; cold sweat; quick, thread-like pulse.

Erigeron.—This drug, like Ergot, acts upon the unstriped muscular fiber of the arteries, and clinical experience has proved it to be of great value in all forms of hemorrhage. It acts best when the oil of Erigeron is administered. I generally use three-drop doses. It is indicated especially when the blood is bright red, increased by every movement, and with violent retching and burning at the stomach.

Hamamelis (1x).—Passive, venous hemorrhage; black blood; tremulous, weak, cold; quick pulse; profuse sweats.

Millefolium (1x).—Active hemorrhage; profuse; blood bright red; great distention.

Aconite (2x) is similar to Millefolium, and has in addition the anxiety and restlessness so characteristic of this drug; precordial anxiety with coldness of the extremities and small, quick pulse. Hempel calls especial attention to the following symptom of Aconite, which often precedes hemorrhage at the stomach, and the reliability of which has been verified: "Sensation as of a cold stone lying in the stomach, notwithstanding repeated stools and vomiting."

Crocus. (2x).—Active hemorrhage characterized by dark, viscid, stringy blood, coming up in black clots, worse on slightest motion.

VI. DISEASES OF THE INTESTINES.

INTESTINAL CATARRH.

Synonyms.—Catarrhal Enteritis, Muco-enteritis, Diarrhea.

Definition.—A catarrhal inflammation of the whole or any part of the intestinal tract. This term includes all those forms of intestinal catarrh that have heretofore been separately considered—duodenitis, jejunitis, ileitis, colitis, and proctitis, as in none of these is the affection strictly limited to the anatomical part of the intestine indicated by the name, and often it is impossible to ascertain positively the exact location of the catarrhal process. Intestinal catarrh may be either primary or secondary, acute or chronic.

Pathology.—In the milder forms of a catarrhal inflammation, we find only the ordinary evidence of catarrh as it occurs in other mucous membranes, being a slight redness and tumefaction, with more or less mucous coating. This may proceed in intensity to complete congestion, the membrane becoming softened and thickened, the process involving, not unfrequently, the submucous tissue. The secretions are abundant, ropy or watery in appearance, and often very irritating, and are sometimes mixed with blood. Superficial erosions or slight ulcerations are not uncommonly observed. The changes which take place in chronic enteritis consist generally in slight condensation and hardening of the mucous tissue, more or less distinct congestion, or black pigmentary deposit in the villi and interfollicular spaces, some degree of atrophy of the Lieberkühnian follicles, and granular or fatty degeneration of their epithelial contents, together with an analogous condition, more or less pronounced, of the epithelium of the mucous surface generally. The solitary and agminated glands are sometimes atrophied, sometimes larger and more obvious than natural.

Etiology.—Primary intestinal catarrh may be caused by: (1) *Errors in diet*, the food being wrong in quality or too great in quantity. The ingestion of unripe fruit, or of food or milk which has commenced to decompose. Individual peculiarities must be taken into consideration in the matter of eating, as a food or drink that will agree with one will invariably cause diarrhea in another. (2) *Local irritants* that find their way into the intestinal tract and act as foreign bodies, such as apple cores, etc. (3) *Impurities in drinking-water* often cause epidemics of enteritis. Strangers are more susceptible to such impurities than are those who are accustomed to the water. (4) *Toxic causes*, such as

tainted foods or inorganic poisons, either acid, alkaline or corrosive. Tainted foods may act as simple irritants, and are mentioned as an error in diet, or may induce toxic symptoms. (5) *Sudden changes in temperature*, especially from warm to cold, or getting chilled when overheated. Prolonged high temperature will also act as a predisposing cause. Diarrhea is supposed also to result from changes in the intestinal secretions and from nervous influences. According to Osler we know too little about the *succus entericus* to be able to speak of influences induced by change in its quantity or quality. It has long been held that an increase in the amount of bile poured into the bowel might excite a diarrhea; hence the term bilious diarrhea, so frequently used by the older writers. Possibly there are conditions in which an excessive amount of bile is poured into the intestine, increasing the peristalsis, and hurrying on the contents; but the opposite state, a scanty secretion by favoring the natural fermentative processes, much more commonly causes an intestinal catarrh. Absence of the pancreatic secretion from the intestine has been associated in certain cases with a fatty diarrhea. *Nervous influences*.—It is by no means clear how mental states act upon the bowels, and yet it is an old and trustworthy observation which every-day experience confirms that the mental state may profoundly affect the intestinal canal. These influences should not properly be considered under catarrhal processes, as they result simply from increased peristalsis or increased secretion, and are usually described under the heading *Nervous diarrhea*. In children it frequently follows fright. It is common, too, in adults as a result of emotional disturbances. Canstatt mentions a surgeon who always before an important operation had watery diarrhea. In hysterical women it is seen as an occasional occurrence, due to transient excitement, or as a chronic, protracted diarrhea, which may last for months or even years. The causes of secondary catarrhal enteritis are: (1) Infectious diseases—septicemia, pyemia, typhoid fever, cholera, tuberculosis, etc.; (2) Extension of inflammation from an adjacent organ or tissue—gastritis, peritonitis, etc.; (3) Hernia, invagination, ulcer or cancer of the intestine; (4) Chronic cachectic conditions, such as occur with Bright's disease, tuberculosis, anemia or cancer; (5) Disturbances of the circulation cause catarrhal enteritis; especially chronic, by producing stasis in the terminal branches of the portal vessels, chronic diseases of the liver (especially cirrhosis), heart or lungs. The *predisposing causes* of intestinal catarrh are (1) Age, the disease being much more common in children, though occurring in all ages; (2) Unfavorable hygienic surroundings. Combine these with a continued high temperature and endemic or epidemic influences and diarrhea will largely prevail.

Symptoms.—The chief symptom of catarrhal enteritis is diarrhea, though this is not always present, especially if it is the small bowel only that is implicated. Then, too, diarrhea is not always an indication of the presence of intestinal catarrh, as it may result from nervous and many other influences. There is usually pain and tenderness over the abdomen, which is especially aggravated by hard pressure, and sometimes there is nausea and vomiting. The pains are mostly colicky and griping in their character, and occur chiefly in the umbilical region. The diarrhea is accompanied by a great rumbling, and as a rule is aggravated by taking food or drink. The stools are more or less frequent, being at first feculent, but soon assuming a watery, gelatinous character, and becoming very irritating. The color of the stools depends upon the amount of bile mixed with them, varying from light yellow or yellowish brown to a dark or blackish brown or even greenish color. They often contain portions of undigested food (lienteric diarrhea) and flakes of yellowish brown mucus. Tenesmus is not present, unless the lower part of the large intestine is involved in the inflammatory process. There is usually considerable febrile disturbance, though this may not seem in proportion to the severity of the attack. The patient complains of headache, languor, aching in the limbs, more or less chilliness, with increased pulse, these symptoms showing the usual peculiarities of an ordinary catarrhal fever. The tongue is generally dry and furred, the breath offensive, and the appetite impaired. If the disease be confined to the rectum, as is sometimes the case, there is a constant desire to go to stool, the passages are mucous, or consist of bloody mucus without any feces, but there are none of the characteristic pains in the abdomen which are present when the ileum and colon are involved.

Microscopic examination reveals micro-organisms, remnants of food, epithelium and mucus in large quantities, crystals of calcium phosphate, calcium oxalate, and occasionally cholesterin and Charcot's crystals. The symptoms of chronic intestinal catarrh are essentially the same as those of the acute variety, though more protracted. The large intestine is almost always involved, giving diarrhea as an almost invariable symptom. In some cases there is alternate diarrhea and constipation. As a rule the stools are thin and fecal, and contain undigested food mixed with mucus. If the mucus be evenly admixed with the stool, the trouble is usually in the small intestine, but if the mucus coats the stool, it comes from the large intestine. In some cases the entire stool consists of lumps or strings of glairy mucus. Blood or pus may be present, the latter indicating ulceration. The diarrhea is generally worse in the morning or after eating. In severe cases the general

health suffers, the patient becoming weak, pale and emaciated. In case the course of either the acute or chronic variety is complicated with symptoms of gastric catarrh, it is termed gastro-enteritis.

Proctitis is a special form of catarrhal enteritis involving the rectum only, and which is more readily distinguished as to location than are the other subdivisions before mentioned. It may be well, therefore, to enumerate the symptoms usually present. In the milder form of proctitis the patient experiences dysenteric symptoms, tenesmus being the most prominent, the stools consisting of mucus mixed with blood. In severe cases these symptoms become greatly intensified, the pain being of a burning character, sometimes tearing and throbbing, often sticking as if something sharp were irritating the rectum and must be forced out. The straining is violent, often causing prolapsus ani, the mucous membrane appearing at its orifice like a dark red cushion, and the stools contain considerable blood. Neighboring organs become irritated, and, as a consequence, we have strangury, painful urination, erection of the penis, metrorrhagia and leucorrhea. The symptoms may after from four to ten days, begin to subside. A free evacuation of partially normal feces may occur, and the patient soon recovers without further trouble. More often, however, either the inflammation extends to the peritoneum or the adjacent connective tissue (periproctitis), or, assuming a chronic form, ulceration and sloughing may ensue, rendering the stools purulent, or muco-purulent, and very offensive. In the latter case, the pains grow less severe and more heavy and dragging in their character, a continuous discharge of offensive pus takes place from the anus, the patient slowly becomes weak and emaciated, and may finally die from extensive ulceration and sloughing, even if perforation has not sooner excited a fatal peritonitis. In case the inflammation extends to the connective tissue about the rectum (periproctitis), we obtain more often discharges either externally or internally, or into the rectum, vagina or bladder, thus forming different varieties of fistulæ. Sometimes dangerous complications arise, such as pyemia, or thrombosis of the hemorrhoidal veins may occur, resulting in the formation of a hepatic abscess by deposit of emboli.

Diagnosis.—There is usually little difficulty in determining whether the diarrhea is due to catarrhal inflammation or to neurotic influences and other conditions that will be described hereafter. It may be distinguished from *colic* by the absence in the latter of tenderness and fever, and presence of constipation and its paroxysmal character; from *typhoid fever*, by the absence of prodromes, characteristic step-like temperature record, and characteristic eruption; from *dysentery* by the absence of scanty, frequent stools and tenesmus; from *peritonitis* by

the absence of intense pain, tenderness, tympany, constipation and general constitutional disturbances that always attend that disease. Proctitis is distinguished from cases of severe dysentery by the absence of flatulent stools and of the general constitutional disturbance so characteristic of the former.

Prognosis.—Intestinal catarrh seldom results fatally, except when occurring in connection with other diseases or in persons of a feeble constitution. Acute attacks last from five days to a week and terminate in recovery. Subsequent attacks and relapses are quite common from repetition of the same exciting causes. In chronic cases the prognosis is not so favorable, but with careful homœopathic treatment few die. Very rarely perforation of the bowel occurs.

Treatment.—Rest in bed is important, but not always readily secured, especially with children. The diet should be restricted to unirritating, bland foods, principally liquid. All food likely to undergo fermentation, such as sugars, or those having considerable residue, and all fruits and vegetables, must be avoided. At first skimmed milk, arrow-root gruel, malted milk, predigested liquid foods, should be the sole diet. When improvement begins, the patient may be allowed mutton broth, chicken broth, boiled rice, corn starch, tapioca, sago or cracker crumbs. The return to ordinary diet should be in all cases gradual, and such articles as milk toast, oysters, well-cooked macaroni, boiled rice with beefsteak gravy, the breast of boiled chicken, or a little partridge in season, with baked and mashed potatoes, may be first allowed. Demulcent and mucilaginous drinks are beneficial. Grape juice and other similar drinks are grateful and harmless. The chief remedies for intestinal catarrh are Acon., Aloe., Ars., Bell., Bry., Calc. carb., Carbo. veg., Cham., Cinch., Coloc., Ipec., Magnes. carb., Merc. sol., Merc. cor., Nux vom., Phos., Podo., Sulph., Verat. alb. For special indications consult article on the "Therapeutics of the various forms of enteritis," page 102.

GASTRO-INTESTINAL CATARRH OF CHILDREN.

Synonyms.—Gastro-enteritis, Ileo-colitis, Entero-colitis, Summer Complaint, Inflammatory Diarrhea, Summer Diarrhea, Cholera Infantum, Mycotic Diarrhea.

Definition and Varieties.—The term gastro-intestinal catarrh is presumed to cover the various forms of diarrhea and intestinal disturbances so common to children during the summer months, from simple diarrhea to the most aggravated form of cholera infantum or enterocolitis. The classification of these conditions has heretofore been and is now quite arbitrary, sometimes based upon the character of the

diarrheic discharge, and more often upon the supposed location in the intestinal tract of the pathological lesion. I shall include under the head of gastro-intestinal catarrh three subdivisions: (1) Simple diarrhea or acute dyspeptic diarrhea, which may or may not be inflammatory in character, though in either case the same causes prevail. (2) Cholera infantum. (3) Entero-colitis, or inflammatory diarrhea.

Etiology.—The causes of the various forms of gastro-intestinal catarrh are practically the same. The same cause or causes that give rise to a simple diarrhea, may, when aggravated and prolonged, cause either cholera infantum or entero-colitis, though of course the possible etiological factors in the latter forms are more varied and multiplied in their character, seldom a single cause operating alone.

Simple diarrhea or acute dyspeptic diarrhea is usually the result of indigestion consequent upon errors in diet, but it no doubt also arises from the influence of cold. Farinaceous and other foods allowed indiscriminately before the digestive powers of the child are capable of digesting and assimilating them, frequently gives rise to diarrhea. In children over two years of age the eating of unripe fruit or drinking tainted milk is a frequent cause. Exposure to cold or wet, particularly sudden changes in temperature, insufficient clothing, etc., is a prolific cause of simple diarrhea. Prolonged extreme heat relaxes and enervates the system and weakens the digestive powers so that this form of diarrhea often results. The causes of cholera infantum and entero-colitis or inflammatory diarrhea are precisely the same. They are chiefly summer maladies attaining their maximum prevalence and mortality in July and August, when the temperature is at its highest. It is not, however, the heat alone which produces these diseases, for they thrive best in large cities, on newly made ground and in low and swampy localities. In the country, on high ground, they are scarcely known. Hence it is supposed that noxious inhalations from various sources, mostly from vegetable and animal decomposition, which arise as a consequence of the heat, combine with the latter and form the exciting cause.

It is therefore certain that antihygienic influences, bad air and improper food, in addition to a high temperature, are necessary to the production of these diseases. Badly ventilated and overcrowded, ill-kept houses, and air contaminated by animal and vegetable decomposition and emanations from cesspools and sewers are potent causative factors.

Errors of diet are essential causes of entero-colitis. Bottle-fed infants rarely escape its effects, and even nursing infants who are

allowed to have improper articles of food more or less regularly are inclined to the disease. It also frequently follows weaning. In my own experience, infants who are nursed at the breast and properly cared for rarely have this disease, or, if they have it, the attack is usually mild and easily controlled. Nearly all fatal cases occur in children who are artificially fed. Out of three thousand fatal cases collected by Holt, only three per cent were children reared exclusively upon the breast. Probably it may be said in a general way that these diseases are largely caused by some sort of errors in artificial feeding. Nearly all fatal cases also occur in teething children, the process of dentition being, to say the least, a very strong predisposing factor. Cholera infantum and entero-colitis may also be produced by exposure to cold, especially during sudden changes of temperature in summer.

High temperature, bad hygienic conditions, and the direct irritation resulting from the use of improper food are the trio of causes which combine to produce these scourges of infancy.

As might be supposed, there are those who assume to believe that cholera infantum and entero-colitis are caused by micro-organisms and their resulting ptomaines, but this has never been proved. No doubt a great variety of bacteria are found in the discharges, but this is equally true in healthy discharges of sucklings, and proves nothing farther than that normal fermentative changes are taking place. After an exhaustive study of the subject, Booker concludes that "not one specific kind, but many different kinds of bacteria are concerned, and that their action is manifested more in the alteration of the food and intestinal contents and in the production of injurious products than in a direct irritation upon the intestinal wall." With these agree the conclusions of Jeffries and Baginsky regarding cholera infantum. Certain it is that up to the present no specific pathogenic microbe has been isolated in these diseases.

Pathology.—*Simple diarrhea* is most often purely functional and presents no pathological changes. In more aggravated cases there may be some capillary congestion with slight redness and swelling of the mucosa. In *cholera infantum* and *entero-colitis* these conditions are more pronounced, the whole intestinal tract showing the signs of an inflammatory process, and in the latter there is hyperplasia of the intestinal follicles and the mesenteric glands are involved. Peyer's patches are much swollen and project like white nodules above the level of the mucosa. These patches often have an ulcerated appearance, but no real ulceration is present. In chronic cases there is a thickening and infiltration extending to the submucous and muscular coats, followed by induration of the tissues, so that the walls of the

intestines are often abnormally rigid. Ulceration occurs, which extends through the entire thickness of the membrane. These ulcers often coalesce, so that large, irregular ulcerated patches are formed, having for their base the submucous or muscular coats, and have a grayish-white color.

Symptoms.— *Simple diarrhea* may be preceded for a day or two with more or less symptoms of indigestion, or the increase in the number of stools may be the first symptom noticed, there being no special constitutional disturbance. In other cases the onset is sudden and the diarrhea accompanied by vomiting, griping pains and considerable fever. The stools rarely occur oftener than five or six in twenty-four hours, being less frequent at night. They consist of lumpy masses of undigested milk or food, but are not watery and contain no mucus. Their color is yellow mixed with green, usually changing to green on exposure to the air. Colicky pain usually precedes the stool, and frequently there is considerable gas in the bowels. Convulsions may occur at the onset or later on, especially in nervous children. The tongue is moist and there is thirst only when the stools are very copious or a high fever is present. The patient emaciates rapidly and out of all proportion to the severity of the disease. The case generally improves in a few days, but relapses are common, and in hot weather the simple diarrhea may develop into a severe entero-colitis.

Cholera infantum may be ushered in suddenly or be preceded for an indefinite period by premonitory symptoms. In the first instance the symptoms closely resemble those of the sporadic cholera of adults. The child, when in full health, and without warning, is attacked with vomiting and purging, which occur in frequent paroxysms of great violence; after the contents of the stomach and bowels are expelled, the abundant evacuations consist of secreted or transuded liquid of a greenish or yellowish color. These symptoms may last but a few hours, and a recovery may speedily ensue under proper homœopathic treatment. If this is not the case, the vomiting and purging continue, there is great thirst, with inability to retain water; the child utters sharp cries as if in great pain, the surface becomes cold, the pulse rapid and weak, prostration ensues, and an early collapse follows, death occurring in from one to three days.

In other cases the choleraic symptoms may be preceded for several days or weeks by a diarrhea which is not of a character calculated to excite alarm. Suddenly the evacuations become frequent and watery, being so thin as to soak into the napkin, leaving a greenish or greenish-yellow stain, and having a peculiar, musty, offensive odor. They may also contain particles of undigested food, milk curds, and yellowish

masses of mucus which turn green on exposure. At the same time vomiting of a sero-mucous fluid sets in, and everything taken into the stomach is rejected immediately, whether it be water or the nurse, the ejected matter frequently containing bile. There is excessive thirst; the tongue at first is moist and usually clean, or covered with a light fur; pulse is quite rapid, and at first full, but soon grows weak, running from 140–160 beats per minute. In the early stages the temperature of the body is natural, or very slightly raised at times, but the temperature at the surface soon becomes reduced.

The stools are often painless, but usually the child whines and is restless before the evacuation occurs, as if it were in pain, and frequently the face shows a distressed expression by a line extending from the labial angle to the inside of the alæ nasi, and sometimes surrounding the orbicularis. Not unfrequently the abdomen is hot and more or less tympanitic; at other times it is cool and retracted, and is usually tender upon pressure along the track of the colon.

The number of the stools vary from four or five to twenty, or even more, in twenty-four hours. The severity of the case is not always dependent upon the frequency of the stools, the infrequency of their occurrence being often offset by excessive amounts, which drain the body of its fluids at a more rapid rate than more frequent evacuations of an ordinary quantity. The urine may become very scanty, and in severe cases it is sometimes entirely suppressed. Often an aphthous condition of the buccal cavity occurs, and an erythematous rash diffuses from the anus over the buttocks and genitals, causing so much tenderness that the contact of the irritating discharges excites pain. The emaciation is rapid and extreme. In a few days the body shrinks, the eyes are sunken and half closed, the mouth remains partially open, the lips are dry, cracked and bleeding, the cheeks hollow, and the face appears shrunken and pallid and the fontanelli are depressed. The child now lies in a torpid condition, is insensible to external impressions, is only temporarily aroused by considerable effort, and apparently suffers only from the distressing thirst which continues to the last. Even when indifferent to all else, and seemingly unconscious, when water is offered, the child will raise its head, seize the cup, and drink with avidity. The body becomes cool, and is covered with a clammy sweat, the eyes are bleared, and the pupils contracted. The pulse continues to increase in rapidity, and becomes more and more feeble; the respiration is accelerated and shallow from pulmonary congestion; carbonic acid poisoning ensues, producing a comatose condition which ends in death. Not unfrequently, before death, slight convulsions and other symptoms of cerebral disturbance supervene.

which may result from uremic poisoning or from that expression of cerebral anemia which Marshall Hall describes under the term hydrocephaloid, in contradistinction to acute hydrocephalus, an inflammatory disease which it simulates, and for which it is sometimes mistaken. In such cases the child grows restless, utters sharp, plaintive cries, rolls its head from side to side, gradually falling into a comatose state, which becomes more and more profound until death ensues.

If the termination is fatal, death usually occurs within three or four days. When recovery takes place, the duration of the disease is from two or three days to as many weeks, and sometimes inflammatory complications, usually entero-colitis, will prolong the difficulty indefinitely.

Entero-colitis usually follows an attack of simple diarrhea, but may come on suddenly with fever, loss of appetite, thirst, nausea, moderate vomiting and abdominal pain, which accounts for its frequently being mistaken for an attack of cholera infantum. The stools are especially acrid and irritating in their character, semifluid, greenish in color and mixed with yellowish fragments of normal feces and undigested casein, constituting what is termed the "chopped spinach" stools. The fever is intense, the tongue is red and smooth, or covered with a white fur, and an aphthous condition of the tongue and buccal cavity usually exists. The child emaciates rapidly, and becomes very flabby and relaxed; the fat and muscles disappear and the skin becomes wrinkled, giving the child a remarkably aged appearance. The inguinal glands become enlarged, the eyes sunken, the abdomen tympanitic, and the child dies from exhaustion or from the supervention of cerebral complications, as convulsions or coma. In other cases the course is not so severe, and convalescence is established in two or three weeks, or the disease becomes subacute, and though the fever subsides, the diarrhea persists and the stools being liquid, pale, fermented and very offensive. The child grows weak and greatly emaciated. After five or six weeks, improvement gradually takes place or the patient dies from exhaustion or from a severe intercurrent attack.

Diagnosis.—The diagnosis of simple diarrhea is an easy matter, but often a simple diarrhea is but a forerunner of something more serious that is soon to follow. This should always be borne in mind, and any coming danger anticipated as far as it is possible to do so. There is not much danger of mistaking cholera infantum and entero-colitis in children for other diseases, but they are constantly being confounded with each other, cases of entero-colitis being very commonly called cholera infantum. The symptoms of the latter are so characteristic that there need be no mistake; choleraic symptoms which are not at all present in entero-colitis—profuse watery stools, severe vomiting, intense thirst, rapid exhaustion and emaciation,

Prognosis.—The prognosis of *simple diarrhea* is favorable, though it is possible that in hot weather and weakly subjects death may occur from exhaustion, or a fatal entero-colitis may follow.

In *cholera infantum* the prognosis should always be guarded, and never unqualifiedly favorable. Even when the disease is apparently subdued, and the patient appears to be improving, the affection may continue as an enteritis, and ultimately prove fatal. The hygienic conditions to which the child is subject have much to do with the result, and the nature and quality of its nourishment is an important item. Cholera infantum rarely occurs in a child nursing from a healthy breast, and when it so occurs the prognosis is much more favorable than in a bottle-fed child, or in one recently weaned. The disease must always be considered dangerous and the result doubtful, even though children seemingly hopelessly ill have made a good recovery.

According to Tooker "the symptoms that are especially perilous are uncontrollable vomiting; a body temperature exceeding 106° or 170° Fahr., or a subnormal temperature of sudden development; profound nervous depression, as indicated by stupor or coma. Favorable symptoms are a falling temperature, if it has been previously abnormally high; or a rising one, if it has been subnormal; quiet sleep, if accompanied by an improvement in the pulse and cutaneous circulation is of the best augury."

Entero-colitis is always a serious malady and very frequently proves fatal, but under careful homœopathic treatment we are usually able to offer a favorable prognosis. It is more fatal in hot weather and in weakly children and during the first dentition.

Treatment.—The *hygienic and dietetic treatment* of gastro-intestinal inflammation is practically the same for all three varieties, the same rules holding good in simple diarrhea as in cholera infantum or entero-colitis, though in a less degree. The special points in the general treatment of cholera infantum in addition to those that will be mentioned for entero-colitis is the need of warmth and stimulation. The former may be secured by hot-water bottles and hot fomentations, and for the latter a few drops of brandy and a little barley water is usually advised. Given ice cold this will also tend to allay the vomiting, as will also champagne or koumiss given cold. Water should be allowed very sparingly. The intense thirst may be modified by allowing the child to suck a piece of ice wrapped in linen. The following remarks apply to both cholera infantum and entero-colitis. It is a well-known fact that the child that is well fed, kept clean, removed from the ill effects of bad ventilation and sewer-gas, and not exposed to extreme heat, rarely has gastro-intestinal diseases. When the mother's health

allows, the child should not be weaned until after the second summer, as that is the most dangerous period of its life. If weaning before that time is unavoidable, it should always be accomplished before the heat of summer commences. The diet should then be pure fresh milk, kept perfectly sweet. When it is possible all milk should be sterilized, and if the digestion is weak it should also be peptonized. Meat in any form, or fruit and vegetables should not be allowed until after the first year of age is passed, and even then they must be used sparingly, prepared with the utmost care. The child should be in the open air much of the time during the day, avoiding the early morning and late evening air as well as the intense heat of the noon hours. When the weather is at all cool or damp, flannel should be worn next the skin.

The first measure to be adopted after the invasion of the disease is the removal of the patient to some high, open, healthy locality, away from the influences which may have given origin to the trouble. The seashore, or some mountain resort, is most desirable, or any moderately elevated locality in the neighborhood may answer, always keeping in view the necessity of a supply of pure water and of good, fresh milk. Those who can not afford such a change should take the more pains to keep the child in the open air and sunlight, with the restrictions above given. Frequent and long rides in the baby-carriage, or, still better, boat riding are of much value to the patient. In some cities arrangements are such that children may be kept on a steam-ferry or excursion-boat most of the day, and the result is decidedly beneficial. When this is not to be had, the poor may make good use of the public parks by keeping their sick children in them for a good portion of the time.

Diet is next in importance; the quantity and quality of the food must be painstakingly watched. Mother's milk, if healthy, is unquestionably the most desirable food; in its absence, a healthy wet-nurse should be secured, if possible. Failing in this, fresh cow's milk may be used, which is to be thoroughly sterilized and peptonized. Especial care must be taken to insure the absolute cleanliness and sweetness of the vessel which contains the milk, and the bottle from which the child is fed should be thoroughly cleansed and scalded after it has been used. In cases in which milk does not agree, on account of the child's inability to digest the casein, barley-water may be used, to which a small quantity of sweet cream must be added. Sometimes a change to farinaceous food is desirable, though such a change involves a certain risk. Boiled or browned flour, graham flour or oatmeal, thoroughly cooked and largely diluted with water, arrow-root and gelatin often prove useful. In such cases I often use malted milk or peptogenic milk powder with advantage. Frequently the child craves an animal diet, and in children

over a year old this craving should not be disregarded. At first, raw meat juice will serve the best purpose. Valentine's meat juice, panopepton, malted meat or beef peptonoids are very desirable. An egg-albumin solution often goes well with such a diet. Nourishment should be given in small quantities and often. For children one or two years old, scraped raw meat is often the best of foods. During convalescence the diet must receive close attention and the patient watched, to see that it does not surreptitiously obtain unwholesome articles of food. Tooker considers that local measures are of very great value in these cases, and should never be neglected. The main seat of the inflammation is, as we have seen, more often than otherwise, in the colon and in the lower half of it, sometimes being confined to the sigmoid flexure. When this is the case, nothing but good can come from flushing out the bowels with hot water, containing some soothing alkali, such as borax. It cleanses the gut of all offending matter, soothes the irritation of the mucous membrane, and acts as an astringent to the congested circulation. When used for their local effect, the enemata may consist of from two to four ounces of water, as hot as can be well borne, into which has been dissolved a third of a teaspoonful of powdered borax. This may be given once or twice daily, or even oftener. Where the inflammation is high up in the colon, the whole viscus may be irrigated. This is accomplished by inserting a large-sized flexible catheter or rubber rectal tube, and carrying it through and beyond the sigmoid flexure, so as to reach as near as possible the ileo-cecal valve. In this way the whole colon may be flushed. At least a gallon of water is necessary, into which half an ounce of borax should be dissolved. Hamamelis (witch-hazel extract) may be used to advantage in some cases instead of borax, especially when there is fresh blood in the stools, or when the discharges contain considerable quantities of inspissated mucus. The hamamelis may be used in the proportion of one part to eight of water. A large-barreled, hard rubber syringe may be used to force the injection; or, better still, a fountain syringe, the bag of which should be held a few feet above the patient. When irrigation is used, once a day is often enough to repeat it.

The remedies most often required in gastro-intestinal catarrh are as follows:—

Simple or Acute Dyspeptic Diarrhea,—Acon., Aloe, Antim. crud., Bell., Bism., Bry., Cham., Cina, Cinch., Coloc., Cupr. ars., Ipec., Merc. sol., Nux vom., Phos. ac., Podo., Rheum, Sulph.

Cholera Infantum,—Verat. alb., Ars., Camph., Cupr., Ipec., Iris, Podo.—Consult remedies for Cholera Morbus.

Entero-colitis,—Acon., Ars., Æthusa, Apis, Bell., Bry., Calc.

carb., Carbo. veg., Cinch., Hell., Ipec., Iris, *Merc. sol.*, *Merc. cor.*, Nux v., Phos., *Podo.*, Rheum, Rhus tox., Sulph. For special indications see article on the "Therapeutics of the various forms of enteritis."

CELIAC DISEASE.

Synonyms.—Diarrhea Alba, Diarrhea Chylosa, White Flux

Definition.—A form of intestinal catarrh chiefly limited to children, characterized by profuse, pale, loose stools, resembling gruel or oatmeal porridge.

Etiology.—This disease is chiefly confined to children between one and five years of age. It is especially prevalent in India, but is not unknown to any European nation, and is supposed to be due directly or indirectly to the influences of malarial poisoning. It is certainly not hereditary and is not tuberculous in its character.

Symptoms.—The disease is very insidious in its approach, the stools not being very frequent at first, and attracting but little attention. The feces are yellowish, or pale drab, or whitish in color, the paleness increasing as the disease advances. They also become more and more watery, gradually lienteric, and sometimes dysenteric in the latter stages, and are always frothy and very offensive. There may be present symptoms of disturbed digestion. The tongue and mouth are sore and red, being studded more or less with aphthous ulcers. The appetite is usually lost, but may be capricious, sometimes voracious, and the abdomen is distended with flatulence. The body becomes anemic and emaciates rapidly, dropsical swellings occur, and the patient finally dies from exhaustion or in convulsions.

Treatment.—We have had little experience in the treatment of this disease, and can only depend upon the indicated remedy. See indications on page 102.

PHLEGMONOUS ENTERITIS.

Definition.—A suppurative inflammation of the sub-mucous layer of the intestine.

Etiology and Pathology.—This disease seldom occurs primarily but may be present in connection with ulceration of the intestines, strangulated hernia and intussusception. Sometimes phlegmonous gastritis occurs at the same time. It may be associated with septicemia or pyemia, or more rarely in malignant scarlet fever or variola, when it results in abscesses in or near the duodenum.

Symptoms.—These are practically the same as peritonitis and from which it can not be diagnosed, except perhaps when associated with hernia or intussusception. The disease is rapidly fatal.

Treatment.—Practically the same as in peritonitis.

CROUPOUS ENTERITIS

Synonyms.—Diphtheritic Enteritis, Pseudo-membranous Enteritis.

Definition.—An intense inflammation of the mucous membrane of the intestine characterized by the formation of a false membrane.

Pathology.—A membranous or diphtheritic deposit is found over the surface, mostly of the ileum and colon, being of a white or grayish-white or grayish-yellow color, and firmly adherent. It consists of corpuscular elements, granules, free nuclei and small, shriveled, irregular and rather granular cells, cemented together by a coagulable exudation, and prolonged for the most part by rootlets from its under surface into the Lieberkühnian follicles. Chemically, these masses are said to have the same reaction as mucus, as might be inferred from the results of the microscopical analysis. Osler defines another form of disease when the affection is really a follicular enteritis, involving the solitary glands, which are swollen and capped with an area of diphtheritic necrosis or are in a state of suppuration. Follicular ulcers are common in this form.

Etiology.—Croupous inflammation occurs mostly during adult life, and rarely in childhood or after forty-five. It is most likely to occur in nervous, hysterical, or hypochondriacal persons, especially women. It is supposed to be caused by the same agencies that may cause catarrhal inflammations, especially those which produce direct irritation of the mucous membrane. Such, however, can only act as exciting causes, for in true croupous inflammation a favorable condition of the system must exist for its propagation. True diphtheritic enteritis may occur by extension of the diphtheritic process downward, and then constitutes a specific disease, due to specific causes. Membranous formations may also occur in the early days of dysentery, but they are quite distinct from the non-contagious croupous inflammation of the intestines. The special causes are usually laid down about as follows: (a) Mechanical irritants (impacted feces, enteroliths, gall-stones); (b) chemical irritants (ammonia, acids, mercury, arsenic); (c) the condition may be secondary to acute infectious diseases and certain chronic complaints (Bright's disease, pyemia, carcinoma)

Symptoms.—The symptoms of croupous inflammation may differ only in degree and gravity from those of the catarrhal variety, or may assume an entirely different form, and can not be said to preserve any characteristic identity. The patient presents no appearance of fever, but seems depressed in both body and mind. He first complains of soreness in the abdomen, which is more or less distended, and there is

obstinate constipation. Severe colicky pains, especially about the navel, occur in repeated paroxysms for several hours, and finally subside, leaving the abdomen sore and very sensitive to pressure, the absence of fever only distinguishing it from the first stages of peritonitis. Diarrheic stools may now occur, containing considerable mucus, and accompanied by much tenesmus. This lasts for a day or two, when the tenesmus becomes very violent, and after great straining, shreds of membrane are discharged, and sometimes cylindrical casts of the bowel. This is followed by great relief, and the patient feels well, save the extraordinary debility, emaciation, and great weariness and languor. Usually these attacks are repeated from a few days to several weeks apart, and may continue until the patient finally dies from exhaustion. Sometimes long intervals of comparative health may occur, and then the attacks return with renewed violence. At other times the paroxysms are less acute, and continue at more or less regular intervals for months and, sometimes, years. The patient usually suffers during the intervals with all the symptoms of disturbed digestion and defective nutrition. The head aches almost continually, the mind is impaired and much depressed, and in women the sexual system is deranged and subject to various diseases, hysteria being nearly always present.

Diagnosis.—This disease should not be confounded with membranous or mucous colitis, an entirely different affection. When the croupous deposits are not discharged *per rectum* a positive diagnosis is impossible, even then a careful and often a microscopical examination is necessary to determine the character of the discharge.

Prognosis.—Croupous inflammation is liable to result unfavorably, though a fatal result is rather the exception. Persons once having had croupous enteritis are liable to a renewal of the attack after a few weeks or months, or even years.

Treatment.—Croupous enteritis may only be avoided by attention to those hygienic measures which serve to impart tone and vigor to the general system, and which regulate the functions of digestion: Whole-some diet, exercise, bathing and regularity in habit, if persevered in, will do much to overcome any existing predisposition to these affections. The remedies oftenest needed are: Acet. ac., Acon., Bell., Brom., Iod., *Kali bichrom.* See Therapeutics on page 102.

MUCOUS COLITIS.

Synonyms.—Mucous Colic, Mucous Diarrhea, Membranous Colitis, Tubular Diarrhea.

Definition.—An affection of the colon characterized by the production of a very tenacious, adherent mucus which may be discharged in long strings or as a continuous tubular membrane.

Etiology.—This disease shows no evidences of inflammation and is supposed to be the result of some form of derangement of the mucous follicles of the colon. It occurs almost exclusively in neurasthenic and hysterical patients, mostly in women suffering from uterine disease and nervous dyspepsia. It may be caused, or at least attacks may be excited, by errors in diet, but mental conditions and worry are the most pronounced etiological factors.

Symptoms.—The disease usually persists for years, and is characterized by irregular paroxysms of abdominal pain, usually intense in character. There is also considerable abdominal tenderness, and often tenesmus. These symptoms followed by the passage of long strings or flakes of mucus, which not infrequently are organized and present definite casts of the bowel. The attacks may last only three or four hours, but more often longer, sometimes for days or even weeks, with temporary amelioration at irregular intervals. The mucous stools do not invariably attend every paroxysm. Marked nervous symptoms are usually present, even to the extent of hysteria, hypochondriasis and melancholia.

Diagnosis.—This is easy, provided no error is made as to the character of the discharge, which is purely mucous, though, if careless, it might be mistaken for worms or shreds of undigested food. The presence of neurasthenia with the symptoms above mentioned should be sufficient to make the diagnosis beyond doubt.

Treatment.—Everything possible must be done to restore the tone of the nervous system and cure the neurasthenia. Hygienic and moral treatment, plenty of fresh air and sunshine, and wholesome, nourishing food are all important. High enemata of warm salt water are very beneficial.

The remedies required depend so largely upon the nervous symptoms that to give anything like a complete list would be impossible. Ign., Nux v., and Phos. ac. are first to be consulted.

THERAPEUTICS OF THE VARIOUS FORMS OF ENTERITIS.

Aconite (3x) is frequently the remedy in the first stage of any intestinal inflammation, especially when resulting from cold. There is a rapid pulse, considerable heat, intense thirst, and great restlessness. Diarrhea from cold or damp, or after checked perspiration; from getting overheated; from getting wet; from anger or fright. In summer when the nights are cool. Stools watery; green, like chopped herbs; scanty, loose, frequent.

Aloes (3x).—Stools bright yellow, pappy; watery, containing lumps of jelly-like mucus. Worse in hot, damp weather; early in the morning; after eating and drinking. Want of confidence in the sphincter ani; rectum feels full of heavy fluid, which seems to fall out without any exertion; involuntary stool with escape of flatus; pain and rumbling before stool; escape of great quantities of flatus with stool; constant urging to stool.

Æthusa (2x) is especially useful in children when there is a great intolerance of milk, which is forcibly ejected as soon as swallowed, vomiting of curdled milk and cheesy matter; dozing after the vomiting spells; abdomen swollen and tense; stools bright yellow, or greenish, watery; pulse small but very rapid; linea nasalis; convulsions with clenching of the thumbs, turning downwards of the eyes, and foam at the mouth.

Apis (3x) is indicated when, in children, the inflammation has been protracted until anemia and nervous exhaustion have reached such a degree as to terminate in hydrocephaloid. The patient may have greenish-yellow stools mixed with mucus, or they may be thin and watery; abdomen sore and distended; urine scanty; no appetite or thirst; sopor, interrupted with piercing shrieks; squinting, grinding teeth, boring head into the pillow. Absence of thirst, with dry tongue and dry hot skin are characteristic.

Arsenicum (3x) is useful in severe attacks, or in the last stages of any form of enteritis. Abdomen distended and painful; stools acrid, black, dark-colored, green, bloody or watery; painless, offensive, involuntary; burning pains in rectum, also in stomach and abdomen; pulse quick, weak and irregular; great thirst, but drinks little at a time; great restlessness and anxiety; weakness and prostration; rapid exhaustion; face hippocratic, pale, covered with cold sweat. All symptoms worse after midnight. Diarrhea from chilling the stomach from cold food, such as ice-cream or ice-water.

Belladonna (3x).—Sudden attacks, or sudden aggravation of an existing attack. Abdomen distended and very sensitive to touch; tenderness aggravated by the slightest jar or motion; stools of green mucus, or containing lumps like chalk; temperature much increased, face red, pulse accelerated, delirium; startings and twitchings during sleep.

Bryonia (3x).—Aggravated by the return of every spell of hot weather, or when hot weather seems to develop the attack. Abdomen distended, sensitive and sore; offensive, bilious, acrid stools, or constipation with stools large, hard and dry as if burnt; tongue thickly coated white; great thirst for large quantities of water; lips dry and parched; pains worse on motion.

Calcarea carb. (6x to 30x).—Especially useful in chronic varieties; fair, plump children; during dentition, open fontanelles; in scrofulous persons of a leuco-phlegmatic temperament. Abdomen hard and very much distended; stools *undigested*, clay-colored, *sour*; chalk-like; patient emaciated, flabby, skin dry and shriveled; head sweats when sleeping.

Calcarea phos. (6x).—Chronic varieties, during dentition or in old people. Delayed closing or reopening of the fontanelles. Offensive stools; aching soreness and pain around the navel, relieved by passing flatus; spluttering stools, forcibly expelled; greenish or undigested; pain in abdomen, heartburn and other gastric symptoms after eating.

Carbo. veg. (30x).—Last stages. Especially old people and children; venous system predominant. Vital forces nearly exhausted, cold surface, especially below knees to feet; lies as if dead; breath cool; pulse intermittent, thready; cold sweat on limbs; voice hoarse or lost.

Chamomilla (3x).—Especially in children, during dentition; also in summer after checked perspiration, or after eating undigestible food. Stools white, slimy, watery; yellowish, like scrambled eggs; hot, small, frequent; smell like rotten eggs; sour. Colic before or during stool, relief after. Child peevish and whining, wants different things, but repels them when given; cries, and is only quiet when being carried.

Cinchona (2x).—Abdomen distended and tympanitic; flatulent, painless, debilitating diarrhea, watery, or containing portions of ingesta; aggravation from eating, especially fruit; attack may have originated from eating fruit. Malarious origin; worse every other day; great debility and prostration; much perspiration; great thirst. Diarrhea during or after severe or chronic wasting diseases; from exhaustion and debility, especially after loss of fluids (lactation, hemorrhages, etc.).

Colocynth (3x).—Only required when the characteristic colic pains are present; griping, twisting, cutting pains, bending the patient double, relieved by the evacuation. Stools copious, fecal, fluid, yellow, frothy, with discharge of much flatus; aggravated by the least food or drink.

Croton tig. (3x).—Yellow, dirty green, or brown, watery stools, coming out like a shot, worse while eating or drinking; often accompanied by nausea and vomiting; while nursing.

Cuprum ars. (3x).—This remedy is one of great importance in all varieties of enteritis, especially when the nervous symptoms and crampy pains predominate. Goodno says, "It is an excellent remedy to begin the treatment of painful cases with sudden onset if some other remedy is not clearly demanded." I generally use the third trituration.

Gelsemium (2x).—Especially useful in nervous subjects: diarrhea excited by sudden depressing emotions.

Gummi Gutti (2x).—Yellow or green stools mixed with mucus; preceded by excessive cutting about the umbilicus; sudden expulsion of stools; worse mornings.

Helleborus (3x).—Abdomen distended; gurgling as if the bowels were full of water; stool consisting solely of clear, tenacious, colorless mucus; weakness; features sunken, face cold, pale, covered with clammy sweat; pulse thready; head hot, heavy; boring head in the pillows; hydrocephaloid.

Hydrocyanic acid (3x).—This remedy is “applicable to cases in extremity, being called for when paresis of the digestive tube causes fluids to roll audibly downward. When this symptom is present, vomiting and purging have generally ceased, the surface is cool, the pulse feeble, and convulsions may appear. Of the officinal dilute acid ten drops should be added to four ounces of water, of which teaspoonful doses should be frequently repeated.” — *Goodno*.

Ipecacuanha (3x).—Especially in children, during dentition; in autumn, after eating unripe fruit and vegetables. Stools green as grass, fermented, attended with colic, and vomiting of a green, jelly-like mucus; persistent and distressing nausea is the most common distinctive symptom.

Iris vers. (2x).—Stool profuse, thin, watery, tinged with bile, corrosive. Great burning in anus after stool, as if on fire; vomiting of an extremely sour fluid, which excoriates the throat, also of sour milk in children.

Magnesia carb. (3x).—Stool green and frothy, like scum of a frog-pond; white masses, like lumps of tallow, floating on the green, watery stool; sour eructations, also sour vomiting.

Merc. cor. ($\frac{1}{3}$ x).—In advanced stages of any variety, with phagedenic tendency. Abdomen distended and very painful to the least touch; violent burning, especially in rectum and anus; stools frequent, nothing but mucus tinged with blood, corrosive ichor oozes from the anus and excoriates the parts; very distressing tenesmus and burning; lies on back with knees flexed; pulse small, intermittent, irregular; surface cold and covered with a clammy perspiration.

Merc. dulcis (2x).—Stools slimy, bloody, acrid and burning; cutting, pinching pain in abdomen, with chilliness; bilious stool preceded by colic and followed by tenesmus.

Merc. sol. (3x).—Abdomen hard, distended and painful; bruised feeling in intestines; violent colic, with cutting and stinging pains, as if caused by knives, worse from even touching anything cold. Diarrhea occurring in damp, cool weather, or in hot weather with cool nights; from exposure to night air. Stools green, slimy, brownish, scanty,

occasionally streaked with blood; sour, corrosive. Colic, burning and tenesmus before, during and after stool; chilliness between stools.

Nux vomica (3x).—Diarrhea from high living; from abuse of alcoholic liquors; after drastic medicines or prolonged drugging; alternating with constipation. Stools dark colored, brownish or greenish; frequent, small; corrosive; offensive; worse mornings. Constant ineffectual urging. After stool, sensation as if more remained but could not be evacuated.

Phosphoric acid (2x).—Diarrhea not debilitating, though of long continuance; involuntary, with emission of flatus; stool thin, whitish-gray.

Phosphorus (3x).—May be useful in any form of enteritis, especially chronic varieties. Abdomen tympanitic and very painful to touch; painless, watery discharges, especially in the morning after getting up; very debilitating; involuntary; gray, or whitish-gray; in children the watery stools contain little lumps of undigested casein that look like tallow; copious like water from a hydrant; purulent; undigested; oozing from the constantly open anus; in debilitated, consumptive patients; in lying-in women; great emaciation, weakness and prostration.

Podophyllum (3x).—This is one of our most useful remedies in intestinal disturbances, especially in the simple diarrhea and entero-colitis of children, particularly when occurring in hot weather and during dentition. Stools changeable in character, worse in the morning; profuse, gushing, painless, fetid; green; sour; yellow; undigested; slimy; clay-colored or like chalk; vomiting of green frothy mucus or of food; moaning during sleep, with half-closed eyes, and rolling the head from side to side (incipient hydrocephaloid).

Rheum (3x).—In children, during dentition. Very sour-smelling stools; child smells sour even if washed or bathed. Straining before stool, and colicky, constrictive cutting in the abdomen after; shivering during stool.

Secale cor. (3x).—Protracted diarrhea in scrofulous children, during summer; putrid, fetid, colliquative. Sudden attacks of involuntary diarrhea in aged persons. Stools brown; dark-colored; thin, olive-green. Aversion to heat or to being covered.

Sulphur (6x to 30x).—In scrofulous or delicate people or children. Diarrhea from suppressed eruptions; from taking cold; during dentition; chronic varieties. When there are repeated relapses, or when the case seems to linger, and remedies do not act. Abdomen distended, tense and sensitive to touch. *Early morning diarrhea, driving out of bed.* Stools watery; frothy, green, watery; fetid, slimy; pappy, greenish, yellow; excoriating; involuntary; sour; fetid; putrid. Offensive odor

of the body, the smell of the stool follows him, as if he had soiled himself. Aversion to washing. Excessive prostration and rapid emaciation.

Veratrum alb. (3x).—Attacks coming on suddenly during the hot season, with choleraic symptoms; severe cases in the last stage; violent forcible vomiting; worse from the least motion, or after drinking, with cold sweat, especially on the forehead. Pulse almost imperceptible. Prostration with cold sweat and cold breath. Stools copious, watery, greenish, mixed with flakes, forcibly expelled. Excessive thirst for cold water.

Zincum (6x).—Goodno says he has "observed remarkable results from *Zincum metallicum* and from the *cyanide of zinc* in the stage of collapse, after cessation of the stools and of vomiting, with a cold, dry surface, sunken features, open eyes, subnormal temperature, and little response to external stimuli, even to flies crawling over the face and corneæ. This is a picture of a bad condition, but recovery has taken place under these circumstances from the sixth trituration and without the aid of other remedies or measures."

CHOLERA MORBUS.

Synonyms.—Sporadic Cholera, Cholera Biliosa, Cholera Nostras, European Cholera.

Definition.—An acute catarrh of the stomach and intestines, occurring in hot seasons, characterized by the suddenness of the attack, which consists in violent vomiting and purging, and is usually attended by cramp-like pains in the abdomen, spasms of the abdominal muscles, coldness, feeble pulse, and great prostration.

Etiology.—Cholera morbus may be caused by exposure to sudden cool changes of temperature during the hot season, as, for instance, passing from a hot room into a cool cellar, or getting wet when overheated. So, also, large draughts of ice-water, taken when overheated, may produce the same result and in the same manner by arresting suddenly the functions of digestion. It is, however, usually considered that these causes, especially the former, are predisposing rather than exciting, and that the chief exciting cause lies in the ingestion of certain indigestible articles of food, such as unripe fruit and vegetables, decayed meat, etc., producing direct irritation or setting up a fermentative process in the stomach and intestines. Even as ancient a writer as Galen attributed cholera morbus to the presence of acrid humors generated by the corruption of food. It is thought by some that this affection involves a special cause, the nature and source of which are yet unknown.

Pathology.—Cholera morbus, being a functional disease, leaves few traces of its effects in the organism. These, if any, are similar, except in degree of severity, to those of true cholera.

Symptoms.—Attacks usually occur suddenly, but may be preceded for a few hours by weight and uneasiness in the epigastrium, nausea, and some diarrhea. The attacks occur most often in the night; the patient is awakened by colicky pains and some chilliness, and is almost immediately attacked with vomiting, first of the food last taken, with gastric mucus and a little bile, afterward of bile and thin mucus alone. Almost simultaneously the purging sets in, first of offensive fecal, diarrhetic stools, and later of mucus and bile. In severe cases the discharges partake more nearly of the "rice-water" character of true choleraic stools, being copious, thin, whitish, odorless, or having a faint, mouse-like odor, consisting of blood and serum, with mucus and casts of epithelium. The acts of purging are usually preceded by pain in the abdomen, which is temporarily relieved by the evacuation. These evacuations from the stomach and bowels are quite copious and occur very rapidly, soon reducing the patient in a remarkable manner, who is often so exhausted after one or two hours as to be unable to rise from the bed. The abdomen becomes contracted, and spasms of the abdominal muscles may occur; the body becomes shrunken, the face hippocratic, the surface cold and sometimes bathed in a clammy sweat; the pulse grows small and weak, the voice is husky and feeble, the tongue and breath cold; cramps may occur in the feet and legs, and there is a great thirst for cold drinks, which are usually ejected as soon as swallowed. The course of the disease is rapid, ending in prompt recovery, or a condition threatening a fatal collapse develops within twenty-four hours. Happily, however, the latter termination is extremely rare; usually, after a few hours the vomiting and purging become less severe, finally ceasing altogether, and the patient, though weak, is generally about on the following day, all the organs immediately resuming the normal exercise of their functions.

In the few fatal cases which occur, the choleraic symptoms become more marked and the patient dies in collapse within a few hours. In some cases the intense symptoms of the affection give way after a few hours to those of a subacute gastro-intestinal catarrh, and convalescence is somewhat tardy, occupying several days. Sometimes, in such cases, fever of a remittent type is developed, which may assume a dangerous typhoid form, or an acute attack of diarrhea or dysentery may be established.

Diagnosis.—The symptoms of cholera morbus are so characteristic that an error in diagnosis is rarely made. The absence of an epidemic

would exclude Asiatic cholera, and in the presence of the latter a technical diagnosis would be of little moment, as the diseases are essentially the same, differing only in degree.

It is sometimes important to distinguish between cholera morbus and cases of poisoning from acrid or corrosive substances. In the latter, there is burning in the stomach before as well as after vomiting has commenced, and the vomiting precedes the purging, whereas they are simultaneous, or nearly so, in cholera morbus, and the vomiting is out of all proportion to the diarrhea. There is more gastric distress and tenderness and burning pain in the abdomen, neither of which are relieved by the evacuation of the bowels. The matter voided is apt to be bloody, and there are often bloody discharges from the bowels, neither of which occur in cholera morbus. Finally, poisoning may occur in any season of the year, while cholera morbus is limited to certain seasons, and the concomitant circumstances will serve to allay or excite suspicion so far as poisoning is concerned.

Prognosis.—The prognosis is almost uniformly favorable, but fatal cases occasionally occur, usually in persons already weak from some other disease. Death may occur within twelve, but oftener after twenty-four or forty-eight hours. The indications for an unfavorable issue have already been noticed.

Treatment.—Cholera morbus seldom occurs in persons who during the heated term exercise prudence in the selection of their diet and are careful to avoid sudden changes of temperature; the wearing of flannel next to the skin is one of the best safeguards against cholera and other bowel diseases occurring during the heated term. Persons not desiring to wear flannel over the entire body should at least wear a flannel bandage over the abdomen, especially if they are somewhat predisposed to acute disorders of the gastro-intestinal functions.

During the attack cold drinks should be limited; it is much safer to allow the patient occasional small pieces of ice to be dissolved in the mouth. If there is great prostration, a little brandy and water may be of service. Sometimes iced champagne will be retained when everything else is rejected. It is a good plan to give a little alcohol in arrow-root or scalded milk, but whatever is given by the mouth should be given in small quantities. During convalescence, and for a few days after, the diet should be guarded. Mutton-broth or chicken-broth, from which the fat has been removed, and light farinaceous foods, with toast, must precede a more substantial diet. Frequently the use of hot fomentations over the abdomen will afford much relief, and the domestic plan of giving the patient a hot pack or bath, in order to produce a profuse warm perspiration over the entire body, often proves very

serviceable. Early in the disease lavage of the stomach and irrigation of the bowels with hot water is sometimes of great service. If there is much loss of fluids, inject a normal salt solution.

Therapeutics.—**Veratrum alb.** (2x) is the remedy most often indicated in this affection. There is violent vomiting and purging, the stools being light-colored, or resembling rice-water discharges. There is extreme exhaustion and copious perspiration, especially on the forehead; the body is cold; the face pale, cold and sunken; the pulse feeble, but rapid, and there are present violent, cutting, griping, colicky pains about the umbilicus, as if the intestines were twisting in a knot, relieved by the stool.

Camphor (Tincture) is the remedy next in importance. It is indicated when cramps in the muscles of the abdomen and of the arms and legs predominate, the vomiting and purging being mild or entirely absent. There is great prostration, coldness and tendency to collapse. I find camphor most useful in those cases resulting from cold. It may be used by pouring a few drops of the tincture on some sugar, and dissolving this in a third of a glass of water, giving a teaspoonful of the solution at a dose. The camphor can not be given in water without the aid of sugar, which acts as a catalytic agent.

Podophyllum (3x) is an excellent remedy when the vomiting and pain are not severe, or are entirely absent, and the stools are profuse, watery, yellow, and of an offensive odor.

Ipecac (3x) is indicated in the milder class of cases when the discharges are green, and the vomiting and retching are very severe, being out of all proportion to the other symptoms.

Arsenicum (3x) is not useful at the commencement of the disease, but when after several hours the pains in the stomach and bowels become very severe, burning or cutting in character, and are accompanied by intolerable anguish and extreme restlessness, this remedy is most valuable. In such cases there is usually extreme thirst, the smallest quantity of water aggravating all symptoms; also embarrassed respiration, weak, almost imperceptible pulse, icy coldness of the skin, and clammy sweat, with subjective heat. It is especially indicated if the lips and tongue become dry, black, and cracked, and when the stools become dark-colored and offensive.

Aconite (3x), *Colocynth* (3x), *Cuprum* (6x), *Dioscorea* (2x), *Cinchona* (3x), *Colchicum* (3x), *Iris vers.* (3x), *Nux vomica* (3x), and *Phosphorus* (3x) may also be consulted.

DYSENTERY.

Synonyms.—Colitis, Ulcerative Colitis, Bloody Flux.

Definition.—An inflammation of the large intestine, accompanied by tormina, followed by scanty mucus and bloody stools, straining and tenesmus. It occurs either sporadically, endemically or epidemically.

Varieties.—The following varieties are recognized, but are so similar in their pathology and clinical history that it seems unnecessary to consider each separately: 1. *Acute Catarrhal Dysentery*. This is the variety usually seen in temperate climates. 2. *Amebic or Tropical Dysentery*. This is the variety that prevails in tropical and subtropical countries, and proves so fatal in epidemic form. 3. *Acute Croupous or Diphtheritic Dysentery*. This form of dysentery may occur in a primary form or may appear as a terminal complication of chronic heart disease, of chronic Bright's disease, of profound cachectic states, or of lobar pneumonia. It is characterized by necrosis, ulceration and sloughing of the mucosa. 4. *Chronic Dysentery*. This form usually succeeds the acute varieties, but in very rare cases occurs primarily.

Etiology.—"Dysentery is one of the four great epidemic diseases of the world. In the tropics it destroys more lives than cholera, and it has been more fatal to armies than powder and shot."—*Osler*.

The writer does not feel warranted in accepting the theory that dysentery is an infectious disease of microbic origin, even though a specific bacillus (*Amæba coli* or *amæba dysentericæ*) may have been found in the amebic or tropical variety. Certainly no specific bacillus has yet been found for the catarrhal or croupous varieties, and even if it had, such fact would not be unmistakable evidence that such bacillus was the sole exciting cause of the disease. The *amæba coli* is found in healthy persons, and also in various intestinal diseases other than dysentery, and in the discharges from secondary liver abscesses. Nevertheless in some manner dysentery may be propagated from one individual to another through the medium of the excretions and inhalations, such propagation being favored by predisposing influences which have elsewhere been described as the general causes producing intestinal congestion and inflammation. Such causes certainly produce sporadic dysentery, and to what extent they are prime factors in the production of epidemic forms, we may not know, though their influence is too apparent to be rejected as at least predisposing elements in the causation of the disease.

Dysentery is essentially a disease of hot climates, and when occurring in temperate regions, it prevails in autumn when the days are hot and the nights chilly, especially in persons much exposed to night air;

it also results from the use of impure water and unripe fruit and other unwholesome food, from the former especially when it contains a decayed animal poison; the emanations from decomposing animal and vegetable matter are also fruitful causes. Bad ventilation, overcrowded rooms and filth are prolific sources; it is on this account that it prevails so extensively among soldiers and in jails and tenement houses—anywhere, in fact, where a large number of human beings are crowded together under unfavorable hygienic conditions. Dysentery is said to be also of malarial origin; at all events, it is especially prevalent in malarial regions, probably on account of the congestion of the portal circulation due to the paroxysms of ague.

Pathology.—Dysentery consists anatomically of an inflammation of the large intestines, resulting in ulceration and exudation of the mucous surface. Hyperemia first appears, but the mucous surface soon becomes very red and thickened, especially about the summits of the mucous folds, the solitary glands and mucous follicles becoming quite prominent, and the membrane swollen and soft, and covered with a mucous secretion which is by many looked upon as diphtheritic or fibrinous in its character. Some authors hold that it is catarrhal in sporadic, and diphtheritic in epidemic dysentery, which theory pathological investigations seem to substantiate, although it can not be admitted that dysentery possesses the contagious properties of diphtheria. This theory may, however, account for the disease-producing properties of the intestinal excreta, for, no matter what our views may be regarding the infectious character of dysentery, it is a well-established fact that the emanations arising from dysenteric dejections propagate the disease. The next step is disintegration of the mucous membrane, which becomes gradually detached in portions, leaving a deep-red, congested surface with ragged edges, which soon becomes the seat of an ulcer, irregular in form, dark-colored and covered with a slough. The fibrinous exudation is at first grayish or yellowish-gray, and covers uniformly the entire mucous surface. This exudation consists of a fibrinous substance with abundant granules, nuclei germs, epithelium cells and young nucleate cells. The exudation partakes of the degenerative process, and soon presents a dense parchment-like, unyielding tissue which becomes gangrenous or is the seat of numerous rapidly spreading ulcers. Sometimes the coats are so rapidly destroyed that perforation takes place, but this is not usual. In such cases the peritoneum presents a dirty-gray discoloration, has lost its luster, and, here and there, dilatation and injection of its capillary vessels is visible. Should the disease terminate favorably, which it may do if the gangrenous destruction is not extensive, granula-

tions spring up and cicatrization ensues, sometimes resulting in contraction, and leading to serious consequences.

According to Osler, the anatomical changes in the colon in chronic dysentery are variable. There may be no ulceration, and the entire mucosa presents a rough, irregular puckered appearance, in places slate-gray or blackish in color. The submucosa is thickened and the muscular coats are hypertrophied. There may be cystic degeneration of the glandular elements.

Ulcers are usually present, often extensive and deeply pigmented, in places perhaps healing. The submucous and muscular coats are thickened and the caliber of the bowel may be reduced. Stricture, however, is very rare. One fifth of the cases of tropical dysentery are complicated by lesions in the liver. There may be areas of necrosis of the parenchyma of the liver, or there may be single or multiple abscesses, consisting of necrotic liver-tissue with a small amount of pus. Amebæ are constantly found in the contents of the abscesses. Rupture of an abscess of the liver into the right pleura, or lung, is not infrequent. These abscesses are due to embolic obstruction of the portal veins. In croupous dysentery perforation is not uncommon. Peritonitis may complicate the disease even without actual rupture, and ulcer of the liver may result from infective thrombosis of one of the mesenteric veins. Should the patient recover, the ulcerations will cicatrize and stricture of the intestine may result; but the healing of the ulcers is very slow, and in many cases chronic ulcerations are left.

Any severe dysentery is liable to be complicated by enlargement of the pancreas and spleen, extensive bronchitis, or lobar pneumonia and pyemic abscesses.

Symptoms.—The symptoms of the several varieties of dysentery differ but little save in degree. The passage of shreds or tubular pieces of false membrane is practically all that distinguishes the croupous variety. The latter may also occur as a secondary disease in various acute and chronic diseases, especially in pneumonia, typhoid fever, nephritis, organic diseases of the heart and pulmonary tuberculosis. In such cases the patient is already ill from the primary disease and the dysenteric invasion is insidious. Sometimes secondary dysentery is mild in degree, in others violent, and often results in fatal asthenia.

The characteristic symptoms of dysentery, and the symptoms which always indicate its presence, are griping pains in the abdomen, followed by scanty stools of mucus and blood, accompanied with much straining and tenesmus. Most cases are ushered in with a preliminary stage, though the epidemic form may begin suddenly and without warning, save a severe chill. The preliminary symptoms are usually

simple diarrhetic stools, slight colicky pains, thirst, and loss of appetite, the characteristic dysenteric symptoms developing gradually. Notwithstanding the severe and long-continued straining, the stools are scanty, and composed of mucus or of mucus mixed with blood; sometimes, however, nothing but blood is passed, and occasionally a few hard scybala accompany the evacuation. The griping and tenesmus are at once relieved by the evacuation, and pain only is felt after hard pressure over the region of the colon; soon the griping pains return, and the scene is repeated, the paroxysms and stools occurring in severe cases as often as every half hour, and even much oftener, the general average being from ten to twenty times in twenty-four hours. In some instances the stool affords no relief; a burning pain in the rectum and a bearing-down sensation in the hips remain, forcing the patient to continued but futile efforts to discharge what appears to him to be a foreign body in the rectum.

In mild cases these symptoms gradually disappear after three or four days, no fever is developed, and the patient slowly recovers, the convalescence being tardy from the dropsical conditions so apt to supervene after mild cases, the blood being loaded with albumen. In the severer cases, either sporadic or epidemic, at this stage the temperature and pulse rise, the tongue becomes coated, the urine scanty and passed with difficulty; there is considerable nausea and vomiting, the bloody stools are more frequent and have a fetid odor; the mucus in the dejections becomes a purulent fluid, and contains numerous shreds and flocculi, and occasionally masses of decomposing sloughs of the mucous membrane, the stool often presenting the appearance of scrapings from a hog's intestines (croupous dysentery). Sometimes the evacuation from the bowels resembles water in which raw beef has been soaked,—a dangerous symptom,—at other times it is dark and tarry, and highly offensive, especially when gangrene of the mucous coat of the intestine has set in. In fatal cases at this stage adynamic symptoms are developed; the heart's action becomes feeble; the pulse frequent, but weak and thready; the mind delirious, the mouth and teeth covered with sordes, the stools are passed involuntarily, the abdomen is tympanitic, the skin cold, there is obstinate hiccough, and the patient dies by slow asthenia.

If the patient recovers, the adynamia does not appear, or if so, in a much less degree; the general symptoms gradually subside, the evacuations become less frequent and contain less mucus and blood and more feculent matter, and the patient slowly convalesces.

If the disease passes from the acute into the chronic form, as it may, especially in hot climates, the fever subsides, the tenesmus and

other morbid sensations are less marked, the stools contain more fecal matter, often assume the form of an ordinary diarrhea, but are not always free from muco-bloody masses or a puriform fluid from the ulcerated mucous membrane; the patient becomes very much emaciated and anemic; the features shrunken and distressed in appearance; the skin dry and bran-like; the appetite impaired; the tongue red and fissured; a hectic fever is developed, followed by night sweats and dropsical symptoms, and death finally ensues. If the patient suffering from chronic dysentery recovers, as is sometimes the case, he usually suffers more or less with chronic constipation and its attendant evils for a long time.

Diagnosis.—The symptoms of dysentery are quite characteristic, and an examination of the stools, taken in connection with the subjective symptoms, make the diagnosis of this disease a comparatively easy matter. It is sometimes difficult in the first stage of sporadic cases to distinguish it from diarrhea; but dysenteric symptoms soon develop and put an end to all such doubt.

Proctitis, or catarrh of the rectum, is sometimes mistaken for true dysentery. In such cases the dysenteric symptoms are milder, and the mucous stools never become foul, nor do they contain the shreds, flocculi and gangrenous sloughs which occur in dysentery.

Prognosis.—The prognosis must be guarded in the first stages of all cases, whether sporadic or epidemic, for we never know what to expect, the general condition of the patient and the surrounding circumstances having so much to do with the development and course of the disease. Sporadic cases usually recover, and a favorable prognosis may be given in epidemic cases when they continue mild, or even in severe cases when there is an absence of adynamia and the signs of collapse. The most unfavorable symptoms are the gangrenous stools, severe hemorrhage, a subsidence of the pain while the other symptoms are growing worse and suppression of the urine.

In the *catarrhal* variety the duration of mild cases is from five to ten days and severe cases from three to four weeks. In the *amebic* variety the prognosis is graver, the mortality in some epidemics having been appalling. In temperate climates under favorable hygienic influences the mortality is light. Recovery is usually tedious, and relapses frequent. It is very liable to merge into the chronic form. Death may result from the violence of the inflammation, from exhaustion in protracted cases or from liver complications. *Croupous* dysentery always presents a grave prognosis. Some cases recover, but in most such the disease becomes chronic. Death may result from the primary violence of the inflammation, from exhaustion, from asthenia, from

peritonitis or perforation, or from abscess of the liver. *Chronic* dysentery usually is of long duration, lasting for months and even years. In most cases the patient finally dies from exhaustion and inanition.

Treatment.—The possibilities of contagion render the prophylaxis of this disease of the utmost importance. During the prevalence of an epidemic, all persons, whether directly exposed to the disease or not, should adhere to a plain, nourishing diet, with a moderate quantity of ripe fruit; they should be much in the open air, avoid exposure and fatigue, wear flannel, at least over the abdomen, and eschew unripe fruit and alcoholic stimulants.

During the early part of the disease the diet should be restricted to a small quantity of light food, milk, eggs, custards, corn-starch, arrow-root, mutton, oyster-soup, broth of mutton or beef, avoiding solid and especially coarse foods. It is the aim to have as little residuum as possible left to increase by friction the irritation of the mucous membrane. In case the symptoms denote a failure of the vital powers, egg nogg may be freely given in connection with a concentrated nourishing diet of beef-tea, or something of a similar nature. In such cases champagne may be used for the vomiting which is liable to be present.

“In chronic dysentery, diet is perhaps the most important element in the treatment. The number of stools can frequently be reduced from ten or twelve in the day to two or three, by placing the patient in bed and restricting the diet. Many cases do well on milk alone, but the stools should be carefully watched, and the amount limited to that which can be digested. If curds appear, or if much oily matter is seen on microscopical examination, it is best to reduce the amount of milk, and to supplement it with beef-juice or, better still, egg-albumen.”
—*Osler.*

Absolute rest in bed is of the utmost importance. The apartments should be well ventilated and the sunlight be permitted to enter; the patient should be sponged occasionally with tepid water, and a high rectal enema or flushing of the colon is often grateful, using either warm or cold water, as may prove most agreeable to the patient. My own experience is that the water should be as hot as the patient can bear. Injections of starch or flaxseed emulsion are a soothing application, and cover the inflamed and irritable membrane of the rectum. If the tenesmus is excessive, from five to ten drops of laudanum may be put into the starch or flaxseed injections to allay the irritability of the muscular fibers. Especial care should be taken to remove the dejections at once from the room, not throwing them into the privy vault, but into a separate pit, where they should be immediately disinfected. The bed pans, vessels, and syringes must not be used for other persons, and all

ordinary precautions must be taken to destroy the virus and to prevent the propagation of the disease.

Therapeutics.—The medicinal treatment of dysentery, unlike that of diarrhea, is confined within a small range of remedies. While many medicines outside of this range may occasionally be called for in individual cases, it is rarely found necessary or desirable to employ them, as they are very seldom indicated.

Mercurius, in its various forms, constitutes the chief remedy. Indeed were specific medication possible, we could agree with Baehr, that the corrosive sublimate “corresponds to the symptoms of ordinary dysentery so perfectly that it may safely be regarded as a specific for the whole process.” Such a doctrine, however, is entirely contrary to the spirit and teachings of homœopathy; a specific for any disease does not exist. Dr. Bell says Merc. cor. “is too frequently employed in dysentery, to which it is only applicable when occurring in great intensity and accompanied by the characteristic urinary symptoms.” It is used extensively by the old school in one-hundredth grain and even smaller doses. The indications for its use are as follows:—

Mercurius cor. (3x).—Stools frequent and scanty, composed of nothing but mucus tinged with blood, or containing shreds of mucous membrane, like the scrapings of a hog’s intestines; offensive; accompanied by very distressing, persistent tenesmus, and cutting, colicky pains; after stool, burning and tenesmus of the rectum and bladder.

Mercurius sol. (3x).—Dr. Dickenson says this remedy “is better adapted to sporadic dysentery, and is seldom indicated in malignant types.” It is especially useful in cases occurring from exposure to cool night air during hot weather. Stools composed of green, bloody mucus, or of pure blood, and very excoriating; colic, burning, and tenesmus before, during and after stool; chilliness between the stools; the tenesmus and urging before and during the stool is rather increased after the stool—a constant ineffectual urging, as if the patient would never get done, the pains sometimes extending to the back. The abdomen generally feels cold, bad taste in the mouth; tongue coated white, or swollen, soft and flabby; rheumatic pains in limbs; worse at night.

Mercurius dulcis (2x).—Goodno recommends this preparation in mild cases, those with the minimum amount of pain, tenesmus, etc.

Nux vomica (3x).—After the abuse of diarrhea mixtures, or of alcoholic spirits, and in persons of sedentary habits who are usually constipated, dysenteries of an intermittent type, constant disposition to stool, with inability to pass anything but a little slimy, bloody mucus; small, hard, roundish lumps of fecal matter, streaked with bright red blood; tenesmus, relieved after stool; pressing pain in the back, as if broken, before and during stool.

Aconite (2x).—After suddenly checked perspiration from exposure to cold; attacks occurring when the days are warm and the nights cool; first stage, with chill, high fever, dry skin, thirst, restlessness; stool frequent, small, composed of bloody, slimy mucus, with tenesmus, which is relieved after the discharge.

Arsenicum (3x).—Stools of thick, dark green mucus; dark, bloody, watery, very offensive, smelling like carrion or discharge from putrid ulcers; frequent; scanty; excoriating; tenesmus and burning in the rectum and anus; great exhaustion after each stool, and some short relief from the pain; great thirst, but drinking little at a time; tongue whitish, fiery red, smooth, and dry, or dry and brown; nausea and vomiting; face pale and sunken; great anguish and restlessness; pulse rapid and scarcely perceptible.

Baptisia (1x).—Dysentery with typhoid tendency; stools frequent, small, thin, dark, fecal, very offensive and acid; pure blood; dark brown mucus and blood; tenesmus; tongue dry, brown down the center; sordes on lips and teeth; breath fetid; face dark red, with a besotted expression; prostration more profound than the severity of the attack would seem to justify.

Belladonna (3x).—Especially useful in the dysentery of children; plethoric young persons, especially in the early stage; stools greenish, slimy, bloody, with great tenesmus and urging; frequent; scanty; tenesmus so severe as to cause shuddering; abdomen distended and very sensitive to touch; tongue red and dry at the tip, or white in the center, with red edges; retention of urine; nervous excitement; starting in sleep; stupor; delirium; face flushed; head hot while hands and feet are cold; rolling head from side to side; throbbing of the carotids.

Cantharis (3x) is well suited to bad cases, especially the epidemic form. When complicated with irritation of the urethra and neck of bladder, causing dysuria. White or pale reddish stools, like scrapings of the intestines; or bloody, watery, skinny, like the washings of meat; with stool, cutting in abdomen; after stool, shivering; violent burning pain through the whole intestinal tract; distention and tenderness of the abdomen; thirst, but loathes any fluids; frequent, painful, ineffectual urging to urinate, with burning after urination; collapse.

Capsicum (3x).—Frequent mucous stools, mingled with dark blood; violent tenesmus, and burning in both rectum and bladder; drawing pain in the back during stool, which, with the tenesmus, are continued after stool; after every stool thirst, and after every drink shivering; stool after drinking; abdomen enormously distended; taste as of putrid water; pains aggravated by currents of air, even warm air.

Colchicum (2x).—Autumnal dysentery. Stools of transparent

jelly-like mucus, or bloody mucus, containing large quantities of small, white membranous particles; violent tenesmus; gripping colic before stool, relieved after; constant ineffectual urging to stool, owing to a spasm of the sphincter ani, with a shuddering on the back; prolapsus ani; coldness and edema of the legs; cramps in the calves; ascites; urine dark brown and scanty; great prostration; aversion to the smell of food.

Colocynth (3x).—Mostly indicated in the first stages, with the characteristic pains. Stools greenish, slimy and bloody, like scrapings of the intestines; renewed after the least food or drink; abdomen bloated; violent pains in the abdomen, as though the intestines were squeezed between stones, which compels the patient to bend double; pain relieved after each stool; weakness, paleness, and great prostration after stool.

Ipecac (3x).—Autumnal dysentery, after eating unripe fruit, vegetable and sour substances. Stools of green mucus, green as grass; fermented; colic; persistent nausea and vomiting; worse in the evening.

Nitric acid (3x).—Subacute or chronic dysentery, especially when the bowels are ulcerated and pus discharged; typhoid type with diphtheritic deposit on mucous membrane of the intestines. After the abuse of mercury or in syphilitic patients; green or bloody mucous stools; flakes of false membrane; putrid; fetid; acrid; tenesmus during stool, great exhaustion after.

Sulphur (6x).—When other remedies have failed; especially useful after aconite has removed the acute symptoms; chronic variety; ulceration of mucous membrane. Stools of blood-streaked mucus; fetid; slimy; excoriating; colic; straining and violent tenesmus; tenesmus continues a long time after the discharge; worse at night or in the early morning; prolapsus ani; dryness of mouth and tongue; tongue coated white with red tip and edges; nausea; vomiting; offensive odor of the body.

Consult also Aloes, Apis, Alum, Argent. nitr., Arnica, Bryonia, Carbo. veg., Cinch., Dulc., Hamamelis, Kali bichrom., Lach., Magnes. carb., Phos., Puls., Plumb., Verat. alb., Zinc.

INTESTINAL ULCERS.

There are several forms of ulcers that occur in the intestinal tract, not including the specific ulcers of typhoid fever, tuberculosis and syphilis.

1. *Round ulcer of the duodenum*.—This ulcer is almost identical in its character and history with gastric ulcer, but is of much less frequent occurrence.

Osler describes the two under one head as essentially the same. The ulcer is usually single and located, in most cases, above the orifice

of the common bile duct. It is usually associated with tuberculosis, or, more especially, with extensive superficial burns, the reason for which has never been satisfactorily explained. Dyspeptic symptoms and vomiting are rare, there generally being only ill-defined, not severe pain in the right hypochondrium, and this occurs later after eating than does the pain of gastric ulcer. Many cases present no well-defined symptoms, and death from hemorrhage or perforation is the first evidence of serious disease. The following table by Anders gives the distinctive diagnostic features of duodenal ulcer and gastric ulcer:—

Duodenal Ulcer.

Usually occurs between 30 and 40 years, except when due to external burns.

Males are more frequent sufferers than females, in the proportion of 10 to 1.

Onset marked by intestinal hemorrhage, which may occur at intervals of varying duration.

The melena may be preceded by or accompanied by hematemesis, though not generally.

Blood in the discharges often is bright red, profuse, sometimes dark, and tarry from the action of acid chyme when slight, though less marked than when from the stomach.

Pain may come on late, two to four hours after meals; more often it is absent. It is localized in the right hypochondriac region.

Gastric crises of much greater violence and without reference to time of taking food.

Hemorrhage from the bowels is apt to occur at time of crises. Vomiting less frequent.

Jaundice occasionally present from occlusion of the bile duct.

Less marked improvement after diet has been regulated.

Painful point is either in the same area to the right or is absent altogether.

The *prognosis* is much more serious than in gastric ulcer. Most cases prove fatal.

Gastric Ulcer.

May occur at any age after childhood.

Females are the chief sufferers.

Gastric hemorrhage is preceded by other gastric symptoms, as a rule; it is apt to be more severe.

Blood may appear in the stools, usually after hematemesis.

The blood in the dejections is dark and tarry from the action of the gastric juices.

Pain paroxysmal, greatly influenced by taking food; often relieved by vomiting. Pain sharply localized in the epigastric region, about two inches below the ensiform cartilage.

Gastric crises coming on soon after taking food.

Vomiting and hematemesis apt to occur at culmination of crises.

Jaundice absent.

Usually a marked improvement follows regulation of diet.

Boas claims to have discovered a painful point over the tenth and twelfth vertebræ, on the left side.

The *treatment* is essentially the same as in gastric ulcer.

2. *Catarrhal and follicular ulcers*.—These result from acute and chronic enteritis and have already been considered.

3. *Stercoral ulcers*.—These result from the continuous pressure of hardened feces, or of enteroliths (due to a deposit of lime-salts) which produce necrosis and subsequent purulent infiltration of the intestinal mucous membrane. They are situated mostly in those localities where fecal accumulations are most liable to occur, as in the cecum, the rectum or the flexures of the colon.

The *prognosis* is good if a correct diagnosis is made and proper *treatment* given, the most important feature of which is a thorough evacuation of the bowels by saline purges and persistent enemata.

4. *Simple ulcerative colitis*.—This affection occurs mostly in men after middle life, and especially in those of enfeebled constitution who have suffered with chronic enteritis. Sometimes the ulceration is very extensive, destroying the greater portion of the mucosa. The muscular walls are usually hypertrophied and the lumen increased. The symptoms are at first poorly defined, but later there is a lenteric diarrhea, or alternate diarrhea and constipation. The nutrition becomes greatly impaired, and the patient looks sallow and becomes weak and emaciated. The tendency is to become chronic, though perforation may occur and death result.

5. *Ulceration from external perforation* may occur from ulceration and erosion of new growths, or by the perforation of a neighboring abscess into the intestine.

6. *Cancerous or sarcomatous ulcerations* may result from the breaking down of submucous nodules.

7. *A Solitary ulcer* may occur in the cecum or colon and result in perforation.

Treatment of Intestinal Ulcers.—The diet is of great importance. The food should be nourishing, but bland and unirritating. Liquid diet is best: malted milk, meat broths, etc. In severe cases a prolonged rest in bed is necessary to accomplish any good results.

I consider *Argent. nit.* (2x) and *Nitric acid* (3x) as the two most important and oftenest indicated remedies. Next in order would probably come *Arsen.* (3x) *Phos.* (3x), *Baptisia* (1x), *Merc. cor.* (3x), and *Sulph. acid* (2x).

INTESTINAL HEMORRHAGE.

Synonyms.—Enterorrhagia, Melena.

Etiology.—Intestinal hemorrhage often arises from some morbid condition which produces obstruction of the portal circulation, as in

obstructive diseases of the liver, especially cirrhosis, and in chronic diseases of the heart and lungs. It may also arise from diseases and injuries which involve the walls of the vessel, as in ulceration; such are the hemorrhages which occur during typhoid fever, dysentery and intestinal tuberculosis, or which result from mechanical or chemical injuries, and consequent degeneration, or after the use of violent purgatives, irritant poisons, the passage of hardened feces and rough calculi. Hemorrhage also occurs from the intestines, as from other mucous surfaces, as a result of certain morbid blood states, as in scorbutic affections, purpura, etc.; also in yellow fever and malignant jaundice, though in these it may sometimes arise secondarily from the ulceration and degeneration of the intestinal mucous lining which may take place in these affections. It may occur as a vicarious discharge, taking the place of normal menstruation, just as vicarious hemorrhages occur from other mucous surfaces. It also accompanies hemorrhoids, either from rupture of the greatly distended and thinned walls of the hemorrhoidal veins or inflammation and erosion of the tumors. It occurs in intussusception of the bowels, from the venous congestion which results as a consequence of the mesentery being dragged into the sheath along with the invaginated part, and the vessels being thereby compressed.

The bursting of aneurysm, emptying its contents into the intestine, or the passage of blood from the stomach into the bowels, after hematemesis, also accounts for the occurrence of hemorrhage from the bowels.

Pathology.—In persons who have died from profuse intestinal hemorrhage, the body presents the signs of general loss of blood. On opening the abdominal cavity, the mesentery, in some instances, appears engorged with blood, especially in cases of congestive hemorrhage, and the intestine, on section, is found to be intensely hyperemic; at other times, however, the mucous membrane is very pale, in consequence of the copious hemorrhage which has occurred during life. In still other cases the mucous membrane has a dark, speckled appearance, which is produced partly by ecchymoses and partly by effused blood, which may be pressed out of the orifices of the follicles.

Symptoms.—The symptoms produced by intestinal hemorrhage vary according to the nature of the diseased condition which causes it. If considerable, we obtain the usual symptoms of intestinal bleeding, deadly pale face, glassy eyes, cold skin, weak pulse, ringing in the ears, giddiness, glimmering before the eyes, and faintness. Sometimes consciousness is entirely lost, and the patient dies at once, without any escape of blood externally; usually, however, there is experienced a sudden and irresistible desire to evacuate the bowels, and there is had one or

more discharges of fluid and clotted blood, or of a blackish, semifluid, tarry mixture. If the quantity is small and comes slowly from the upper part of the small intestines, it is usually more or less dark, being often quite black, and presenting a tarry, sooty aspect; occasionally it resembles coffee-grounds. If originating from the same source, being at the same time copious and speedily expelled, it may be little altered, though it is usually of a very dark color. This change in the character of the discharge is due to the action of the acid contents of the intestines, transforming the hemaglobin of the blood into hematin. When coming from the large intestines, especially near the anus, the blood is generally quite bright and unchanged. If the bleeding originates in the rectum, the discharges may take place before, with, or after the passage of feces; which may be covered with blood, but are not mixed with it. Should the blood continue to escape in only small quantities and slowly, it causes gradually increasing weakness and anemia; but if the discharge is copious, and the attacks are repeated in quick succession, we get the evidence of collapse before mentioned. If the hemorrhage is arrested, normal stools appear in due time, and the patient slowly regains his health and strength. Relapses are quite common, and depend not only upon the habits and conduct of the patient during convalescence, but also, and largely, upon the etiological conditions present.

Diagnosis.— It is of first importance to determine whether or not the discharge consists of blood, as the black, tar-like appearance of the stool may arise from the use of iron, or more often from the admixture of bile. This may easily be settled by a microscopic or spectroscopic examination for hematin; but a simpler and much more available plan is to throw the discharged mass into water; if containing blood, it will color the water red; if it only contains bile, the water is colored green or yellowish.

It must next be determined from what locality the hemorrhage arises. The symptoms already given usually are sufficient to approximately locate the origin of the hemorrhage. So, also, if the character of the disease which causes the hemorrhage is once ascertained, we can readily locate the point of discharge. For instance, if we discover that the bleeding is hemorrhoidal, or occurs in typhoid fever, in dysentery, etc., we can at once, and positively, locate the source of the bleeding.

Prognosis.— Intestinal hemorrhage, when not resulting from hemorrhoids, may always be considered a grave symptom, the full import of which can only be understood by a knowledge of the morbid state which is producing it. Mild hemorrhages may often be not only harmless but apparently beneficial; they are at times followed by the relief

of distressing symptoms, and often, in grave acute diseases, mark the critical period where convalescence begins. When, however, the hemorrhage becomes profuse, whatever be the cause, it may well excite serious apprehensions. The patient may succumb at once, or the hemorrhage, even if checked, may recur.

The prognosis properly depends upon the amount of blood lost, and upon the nature of the morbid condition which forms the primary etiological factor in the case.

Treatment.—Intestinal hemorrhage, then, is but a symptom of the disease with which it is associated. While the treatment must be chiefly medicinal, the same general principles and methods are, to a considerable extent, required in its management upon which dependence is placed in managing other forms of hemorrhage. Persons subject to bleeding from the bowels should scrupulously avoid violent exercise at all times, and during the attack, and for some time after, absolute quiet is indispensable. Sometimes, ice-bags applied to the abdomen are of great service. The continuous injection of hot water is one of the safest and most reliable auxiliary measures.

Drinking of alum whey has been highly recommended. It is very seldom that the proper remedies fail to check hemorrhage, and the auxiliary measures, so necessary in the ordinary treatment of this symptom, are seldom required by the homœopathic physician.

Therapeutics.—**Ipecac** (3x).—Hemorrhage of profuse, bright red blood; heavy, oppressed breathing; nausea and inclination to vomit.

Hamamelis (Tincture).—Passive hemorrhage of dark venous blood, sometimes in large quantities.

Erigeron (Tincture or oil).—Profuse flow of bright red blood; every movement increases the flow.

Cinchona (2x).—Passive hemorrhage after exhausting disease; great debility; abdomen tympanitic; coldness and blueness of the skin; suitable to persons who have lost much blood, even in severe cases; heaviness of head, ringing in ears, vertigo, vanishing of senses, sopor, fainting fits, cold extremities; face pale and sunken.

Arsenicum (3x).—Tedious, long-continued passive hemorrhages, resulting from constitutional diseases, such as carcinoma, typhoid fever, purpura, etc.; great debility, and lancinating, burning pains; great mental restlessness and anxiety; face pale, sunken, deathly, or having a yellow, cachectic look.

Carbo veg. (6x).—Passive venous hemorrhage, after protracted and exhausting diseases; vital forces nearly exhausted; cold surface, especially below knees to feet; lies as if dead; breath cold; pulse intermittent, thready; cold sweat on limbs; especially in old people or children.

Sulphuric acid (2x).— Hemorrhage of black blood; extreme weakness and exhaustion; weak feeling in abdomen; profuse perspiration, especially in old people.

Hydrastinine hydrochlorate.— Goodno says he has employed this remedy "with remarkable results in both passive and active bleeding, giving the second decimal trituration, or one-quarter to one-eighth grain hypodermatically."

Consult *Aconite* (2x), *Arnica* (2x), *Crocus* (2x), *Millefolium* (1x), *Nitric acid* (3x), *Phos.* (3x), *Sulphur* (30x), *Terebinth.* (3x).

APPENDICITIS.

Definition.—An inflammation of the appendix vermiformis, either catarrhal, ulcerative or interstitial in its character. Until quite recently this serious and much-dreaded disease has not been fully understood, and was supposed to be an inflammation of the cecum (*typhlitis*) and its coverings (*perityphlitis*), and was so described. It is now well known that the latter affections are of comparatively rare occurrence. No doubt some of the milder cases of appendicitis are really typhlitis or perityphlitis or both, but a positive differential diagnosis is impossible, and for the most part unnecessary, except, perhaps, as regards the necessity for surgical interference and prognosis.

Varieties.—1. Catarrhal Appendicitis. This form is described by some authors as obliterative appendicitis. It may either be acute or chronic. 2. Ulcerative or Suppurative Appendicitis, either acute or chronic. 3. Interstitial or Parietal Appendicitis. This variety is also described as acute, infectious, perforative and gangrenous appendicitis. This classification is entirely pathologic, and aside from the morbid changes which occur in each variety there is no necessity for a distinctly separate consideration.

Howard Crutcher makes no classification whatever and very appropriately remarks that "it were better to bear clearly in mind the successive stages of inflammation and the various terminations of this process, and apply them to the appendix precisely as they are applied to other structures. The terms catarrhal, gangrenous, perforating, etc., are simply descriptive of certain degrees and terminations of the inflammatory process."

Pathology.—Crutcher defines appendicitis as a peritonitis of appendicular origin, and that "the appendix itself can not be regarded as more than a focus of infection."

He says: "It is a vast misfortune for the human race that the term appendicitis ever became fixed in the popular mind." He considers it as "clinically a misnomer, used to designate peritonitis having its

origin in the right iliac region." Even if these advanced views prove to be true, it is well known that other tissues than the peritoneum are involved, and in many instances, in mild cases, the peritoneum is not affected. I shall give briefly the latest accepted views regarding the varieties as already described, yet agreeing with Crutcher that these "are simply descriptive of certain degrees and terminations of the inflammatory process."

1. *Catarrhal or Obliterative Appendicitis*.—The latter term is applied to this variety for the reason that the changes are not confined to the mucosa but involve all the coats, including the serous, the term catarrhal therefore being obviously inapplicable. The tendency of the inflammatory process is to produce narrowing or complete obliteration of the tube, therefore the term obliterative is descriptive and eminently appropriate. The primary changes are those of catarrhal enteritis, but the inflammation rapidly spreads to the other coats of the bowel, with cellular infiltration and consequent firmness and rigidity of the appendix. The mucosa usually becomes denuded and presents a granular surface, when, if pressure occurs, the opposed granulating surfaces are brought in contact, adhesion occurs, and the lumen of the tube is permanently obliterated, rendering subsequent attacks impossible. If this does not occur, the case usually becomes chronic and frequent relapses take place. In case the lumen is obliterated at its opening, but not throughout its entire length, then dilatation takes place, and the cavity becomes cystic, or it may contain a serous or purulent fluid. In these and other cases ulceration and perforation may occur, even without the presence of a foreign body within the appendix. Thus it is seen that catarrhal appendicitis may terminate in complete obliteration, stenosis, ulceration, and in the latter case sometimes in perforation.

2. *Ulcerative or Suppurative Appendicitis*.—This term is applied to that form of appendicitis which is the result of fecal and other concretions or foreign bodies in the appendix. It may also accompany chronic catarrhal appendicitis. Foreign bodies do not always excite appendicitis. In fact, they sometimes produce atrophy. Sometimes the ulcer heals, and causes stricture, and less often extends in depth until perforation results.

3. *Interstitial or Parietal Appendicitis*.—This is the most fatal form of appendicitis. It usually follows the catarrhal or ulcerative varieties. Necrosis and sloughing take place either of the whole or a portion of the appendix. In the latter case perforation occurs, and in the former the whole appendix sloughs off *en masse*, in either case producing the most intense peritonitis of violent and infectious type.

"Most commonly the gangrene is localized to one spot, either at the tip or in some portion of the tube. Usually the organ is swollen; the color may be reddish-brown, black, or greenish-yellow. Necrosis may occur *en masse*, and the entire appendix may indeed slough off from the cecum and lie free in an abscess cavity." (Osler.)

According to Anders the histo-pathologic changes may be characterized by intense cellular exudation, necrosis, or purulent inflammation.

Consequences of Perforation.—Acute general peritonitis or a circumscribed peritonitis with abscess is a constant result of interstitial appendicitis.

Acute General Peritonitis.—This occurs when the appendix is not encased with adhesions, and perforation takes place directly into the abdominal cavity, and also, probably more often, from an extension of the inflammation from an abscess located in the peri-appendicular tissues.

Circumscribed Peritonitis with Abscess.—In most cases as a result of perforation there is formed a circumscribed abscess within the peritoneum. This may vary in size and location, the appendix not always being in the same anatomical position. While the most common situation may be at or near the angle of ileum and cecum, it is not very unusual for it to be within the pelvis or at some point in the abdomen higher up. Most often the abscess is found at a point in the iliac region midway between the umbilicus and the anterior superior spinous process. Probably in many instances the abscess becomes localized by adhesions after perforation has taken place, thus giving rise to no serious consequences, and may only be discovered after death has resulted from other causes. The contents of the abscess may vary according to its age. In recent cases it is usually a thick, grayish-yellow pus, but in old cases it is dark gray in color, and yields a very offensive odor. Often associated with the intra-peritoneal abscess there is more or less extensive extra-peritoneal suppuration. In cases where early operation has not been resorted to, perforation may take place in such a manner as to produce a more or less extensive retro-peritoneal abscess, or what has been known as an "iliac abscess." In other instances the pus may pass downward and accumulate beneath the iliac fascia, finally rupturing externally near Poupart's ligament, and recovery takes place. Rupture may take place into the rectum, bladder or vagina, or, if the abscess points upward, it may rupture into the perinephritic region, into the pleural cavity, or into the cecum or colon. The abscess may follow the course of the psoas muscle and perforate the hip-joint or reach the gluteal region or the scrotum. Perforation may take place into a hernial sac. Fatal

hemorrhage has resulted from the erosion of one of the arteries in the iliac region. Pylephlebitis may also occur, and, as a consequence, infectious emboli may be conveyed to the liver, giving rise to hepatic abscess. In the healing process the iliac veins may become greatly compressed, giving rise to edema of the corresponding leg, and sometimes permanent enlargement.

Etiology.—Appendicitis is of more frequent occurrence in the young than in the old. Over one half of the cases are said to occur before the twentieth year. It is much more common in males than females. Fecal or other concretions and foreign bodies are the cause in about half the cases. The foreign bodies may consist of grape seeds, orange pits, worms, beans, gun-shot, pills, bristles, pins, fish-bones, etc. As a matter of fact, however, such foreign bodies are not nearly so frequently the cause of appendicitis as has been supposed. In most such instances it is probable that an appendolith rather than a seed or fruit pit was the irritating cause.

It is also supposed that strictures or torsion of the tube are exciting causes. Typhoid and tuberculous ulcers may cause appendicitis. It may result from straining efforts, great muscular exertion, heavy lifting, running, jumping, etc., or, less often, from direct traumatism, falls, blows, kicks, etc. Errors in diet and the ingestion of indigestible articles of food are important etiological factors, especially in recurrent cases. Much effort has been made to show that the disease is directly caused by micro-organisms. Several specific organisms have been found, and no doubt when the lesion is already established from other causes they may become pathogenic and increase the violence and virulence of the attack, but it has not been shown that they constitute a primary cause.

Symptoms.—Catarrhal Appendicitis may be gradual or sudden in its onset. If gradual, there is a preliminary diarrhea, or diarrhea alternating with constipation, and a pain which is either of a colicky character or is localized in the right iliac fossa. Cases with a sudden onset are initiated by a chill or by chilly feelings. As the disease develops the temperature rises to a moderate degree, usually ranging from 100° to 102° F., but in some cases it rises very rapidly, soon reaching 103° to 104° F., especially in children and in plethoric young people. The pulse is usually higher in proportion than the temperature, and in bad cases is usually very rapid. The severity of the case, however, can not always be estimated by the temperature and pulse, but they are important diagnostic signs, as the characteristic pain in the right iliac fossa without fever would rarely indicate appendicitis. With the fever comes gastro-intestinal disturbances,—headache, loss of appetite, nausea and vomiting, often constipation, and usually great prostration,

Local symptoms consist of pain and tenderness. The former is located in the right iliac fossa, and may be steady or paroxysmal, varying in intensity from a feeling of soreness to a most excruciating suffering. Should the appendix be abnormally located, the location of the pain may vary, and in some cases it can not be localized. The more severe the pain, the greater the severity of the case, though exceptional cases occur. Fixed tenderness over McBurney's point is an important diagnostic symptom, though displacement of the appendix may, as it rarely does, cause the point of tenderness to be noted at some other location. In some instances it is at first elsewhere, and later shifts to its proper anatomical location. If the appendix be displaced behind the cecum, tenderness may not be elicited at McBurney's point, but may be detected by vaginal or rectal examination; hence, in doubtful cases, these methods of examination should always be resorted to. The thigh is usually flexed to relax the anterior abdomen; it may be adducted from irritation of the obturator nerve within the pelvis. When the tenderness occurs, as it usually does, at McBurney's point only the slightest pressure is required to cause most intense pain. When displacement of the appendix is present, deep pressure is often required. It is a sure diagnostic point, however, that if appendicitis is present, localized tenderness may invariably be discovered by a more or less deep pressure with the finger tips. Within a day or two there occurs a circumscribed induration at the affected point, soon followed by swelling, which may form a distinctly resistant mass resembling an enlarged appendix. The induration may at first be more or less diffuse and become circumscribed later on. In case the appendix is deep-seated, the induration may not be readily recognized. Percussion is of little aid as the dullness present may result from the presence of fecal masses. After a varying time, according to the rapidity of the case, tympanitic distention occurs, especially in the cecal region.

There is usually great irritability of the bladder, the urine being scanty and often containing albumen. The course of the disease in about half the cases, as near as can be ascertained, is mild, and results in resolution and recovery. In the other half, ulceration or intestinal inflammation develops, usually with great rapidity, resulting in the formation of an abscess or general peritonitis. In some cases those who recover (*vide* pathology) suffer more or less frequent relapses for a long time, but many eventually entirely recover, though many tire of waiting, and submit to a surgical removal of the appendix.

Severe cases tend to perforation and consequent localized peritoneal abscess or general peritonitis, and even milder cases may terminate in the same manner. In case a local abscess forms, the symptoms

already described begin to increase in severity about the seventh day, though in some cases as early as the fourth or fifth day. The area of tenderness extends, and induration at the local point is decided, so that a more or less distinct mass is observed, over which there is some bulging, and a percussion note of dullness is obtained. If the abscess be small and be situated behind the cecum and the distended intestines, tenderness on palpation will be elicited, but no tumor can be detected, although there may be a sense of resistance to palpation. The percussion note is tympanitic, and some edema may be noticed in the right lumbar region. If the abscess encroach upon the pelvic space, the physical signs may not be elicited by external abdominal examination, but rectal or vaginal examination detects the presence of the abscess.

According to Osler "the two most important elements in the diagnosis of abscess formation are the gradual increase of the local tumor and the aggravation of the general symptoms." If left alone and general peritonitis or septicemia do not develop, the patient may improve to such an extent as to leave his bed, but carrying with him the abscess and its future possibilities. Or, the abscess may rupture into the peritoneal cavity or into the rectum, bladder or vagina, with the usual consequences. During all this time the constitutional symptoms progress in accordance with the degree of suppuration. Death results either from rupture into the peritoneum or from septicemia.

If *general peritonitis* results either from perforation of an abscess or from direct extension, we have the usual symptoms of that disease superadded to those already existing. Osler says that "death in appendicitis is usually due to peritonitis" and "*the gravity of appendix disease lies in the fact that from the very outset the peritoneum may be infected; the initial symptoms of pain, with nausea and vomiting, fever, and local tenderness, present in all cases, may indicate a widespread infection of this membrane.*"

Diagnosis. — Typical cases presenting sudden severe pain in the right iliac fossa, with localized tenderness, fever, vomiting and constipation, with or without a tumor, offer little trouble as to diagnosis, as such cases are safely considered appendicular; but in typical cases, especially where the appendix is abnormally located, the diagnosis is often made only with great difficulty. Only a very careful manipulation of the entire abdomen, often aided by bimanual vaginal and rectal examination, will lead to the discovery of the local point of disease. When a gangrenous condition is present, there is great danger of being deceived. The acute symptoms disappear, and the patient may be pronounced convalescent, when unexpectedly a rupture of the abscess occurs with the usual consequences. There are a number of abdominal diseases that

are liable to be confounded with appendicitis. I recently called a distinguished surgeon, a gentleman of great diagnostic ability, in consultation in a case that proved to be movable kidney, which, after a careful examination, he pronounced as chronic appendicitis. Anders reports a similar case, but such a mistake rarely occurs. A case of simple typhlitis with impaction of the cecum is quite liable to be mistaken for appendicitis, and from a practical standpoint differs little from chronic appendicitis with fecal impaction. However, the absence of primary fever and exquisite local tenderness, the presence of a superficial sausage-shaped tumor, usually of a doughy feel, with dullness on percussion, is generally sufficient to differentiate from appendicular inflammation. In such cases also a complete emptying of the colon usually cures the typhlitis.

Salpingitis and pelvic-peritonitis may simulate appendicitis, but the history of the case, with a careful bimanual vaginal examination ought to be sufficient to establish the character of the disease. Acute ovaritis on the right side gives less local tenderness, and is always associated with more or less of the usual utero-ovarian disturbances. In renal colic the attacks are sudden and violent, the pain follows the course of the ureters, there is usually irritation of the bladder and hematuria, and an absence of fever and of localized tenderness. Intussusception and strangulation of the intestines, after general peritonitis has set in, may simulate appendicitis, but in the former the tumor, if any, is not at McBurney's point, the local tenderness is not so intense, and there are bloody discharges and tenesmus which are not characteristic of appendicitis. If strangulation exists, we obtain in addition to the above symptoms fecal vomiting, which is absent in appendicitis. Typhoid fever is sometimes mistaken for appendicitis, but the type of the fever, its continuous character, the absence of intense local tenderness and the characteristic diarrhea are usually sufficient to render the diagnosis certain.

There are many other diseases that simulate, in some respects, appendicitis, but a careful examination ought to be sufficient, though in some instances an exploratory incision alone will establish an unmistakable diagnosis. In chronic appendicitis, Edebohls employs the following method for examining the appendix: "The patient lies upon his back with the examiner at his side; the latter places his right hand upon the patient's abdomen over the right rectus muscle, opposite the anterior superior spine of the ileum, and presses the left hand upon the right, so that no force is used by the right hand and the tactile sense of its fingers is left undisturbed. The hands are drawn slowly outward, allowing the contents of the abdomen to slip from underneath them.

The coils of intestine can be felt as they escape from under the hand as it presses against the posterior abdominal wall." In this manner a painfully tender elongated tumor, about the size and shape of the little finger, can be felt either deep-seated or apparently near the abdominal wall.

Prognosis.—Osler says: "While we can not overestimate the gravity of certain forms of appendicitis, it is well to recognize that a large proportion of all cases recover. It is the element of *uncertainty* in individual cases which has given such an impetus to the surgical treatment of the disease." This statement is undoubtedly true. Many cases die that might have been saved by a timely operation, but on the other hand, the surgeon's knife is often unnecessarily called into requisition, and no doubt, in some cases at least, with fatal results. Everything depends upon the recognition of the character of the individual case, and this is often not an easy matter. The temperature and pulse do not always truly indicate the gravity of the case. Acute catarrhal appendicitis, even with a rapidly high temperature and rapid, strong pulse, will almost invariably yield to proper treatment. When, however, there is a rapidly spreading peritonitis, suppuration and perforation, the contrary is equally true. "The most painful cases are not necessarily the most dangerous, nor are the least painful ones to be passed over as favorable. Often the degree of pain is out of all proportion to the danger of the attack. The sudden subsidence of pain, or its quick reappearance, are symptoms that are full of danger. Rapid shifting of pain is also a significant indication, which means no good thing for the patient. Distention is always present in some degree, but extreme distention is distinctly unfavorable. Vomiting is generally present during the early hours of an attack, but, unless persistent, is not of especial prognostic value. Incessant empty retching is exceedingly unfavorable, and if accompanied by extreme bloating and a pulse beyond 120, almost certainly indicates a fatal issue. When it is found that a pint of foul pus can be diffused over the abdominal contents, and remain for hours without sending the temperature higher than 99°, the uselessness of the thermometer in this disease may be judged. While it is true that a rapid pulse and a high temperature are ordinarily associated with destructive processes, a low pulse and nearly normal temperature often mask a fatal condition until too late to save the patient. The appearance of shock at any stage of appendicitis means either perforation of the appendix or the rupture of an abscess into the peritoneal cavity; in any event, it is a symptom of the deepest significance, and its presence must not go unheeded a moment. At times the outlines of shock are so delicate that they are apt to be undetected, and violent

symptoms of shock are very rare. In primary attacks the mortality is lowest and the prognosis most favorable. A secondary outbreak is in the nature of things more to be feared than the primary; the mortality is higher and the probabilities of safe recovery are less than in the former attack. It may be said that the danger in appendicitis increases with the number of succeeding attacks." (Crutcher.) The gravity of a case can not always be determined by the severity of the onset, as often cases starting with great and sudden violence seem to be easily controlled, while others more mild in their onset soon become unmanageable. A chill, however mild, during an attack of appendicitis, indicates the presence of pus. A violent and prolonged chill must be regarded with alarm, and active measures be at once adopted.

Treatment.—The first point in the treatment of appendicitis is to place the patient in bed, and insist upon absolute rest and quiet. The next point is to at once begin the administration of the indicated remedy, which in a great majority of cases is *Belladonna* (2x). It is a rare thing to find any other remedy indicated in the immediate first stage of acute appendicitis. Aside from the symptomatology of the drug, we also know its value in the treatment of rapid, violent inflammations where the tendency is to the formation of pus. My own experience is that its effects are often magical, dissipating the inflammatory process before the peritoneum becomes involved; and before product formation has taken place. In some cases *Merc. cor.* is also demanded. I invariably supplement the action of *Belladonna* with a warm rectal enema and with hot fomentations very frequently repeated, over the seat of the disease, and restrict the patient to a limited diet, usually malted milk or peptonized milk or concentrated broths. This done, there is time given to consider the all-important and often extremely difficult question as to whether or not operative measures are required in this individual case. No doubt it is a wise policy to at once secure the advice of a competent surgeon. The great trouble is that almost all surgeons, who are capable of operating, believe in resorting to immediate operation in all cases without discrimination, while on the other hand, many physicians are equally as decided the other way, and will not consent to operative interference under any circumstances. Both are wrong. Each case is a law unto itself and must be judged on its own merits. If there is grave doubt as to which is the better plan to pursue, it is altogether probable that the surgeon's knife should be called into requisition. As has already been said on a preceding page, many cases of acute catarrhal appendicitis are easily and promptly cured without surgical interference, but the difficulty is to say whether or not the case in hand will so readily respond,

and whether there is not great danger of delaying the case just long enough so that it is, as Richardson remarks, "too late for an early operation, and too early for a safe late operation." It may be a strange experience, but at the same time it is true that I have had many cases of acute appendicitis, and have never yet in any case required the services of a surgeon, though I have always been ready to resort to surgical measures could I see the necessity. It is also a fact that I have several times taken patients from under the immediate shadow of the surgeon's knife, and cured them without operation. But I have realized the gravity of the situation just the same, and realized that it is not always possible to foresee those terminations of the disease liable to take place in any case, and which, could they be foreseen, would indicate an early operation. I have seen cases in the hands of other physicians where I am sure life was sacrificed because they would not consent to a timely operation. I agree with Goodno that "if at the end of twenty-four or forty-eight hours there has been no abatement of symptoms, and the pain, especially, is no better, an operation is generally called for. Increased tenderness and tympany make the demand for operation imperative." Crutcher remarks that "the sudden subsidence of pain, or its change of position, are expressions of equal or greater value."

The following very excellent rules are advanced by Dr. George F. Shady: "1. The continuously frequent, or progressively accelerated pulse rate is of itself a prime indication for operation.

"2. Pain, localized and progressive, is a valuable associated condition. When pain is sudden, severe and progressive, and accompanied with chill, it means perforation or abscess rupture and immediate operation.

"3. Increase of temperature is third in importance, but when associated with one or more of the previous symptoms, and more especially with increase of pulse rate, it makes immediate operation a foregone conclusion.

"4. The gradual subsidence of the three cardinal symptoms—pulse rate, pain and temperature—is a legitimate reason for postponing immediate operative interference.

"5. In cases of abscess, it is generally safer, while watching for urgent indications, to wait until adhesions have formed a sufficiently protective wall.

"6. In cases of recovery after mild attacks, and without operation, we are never sure of recurrence until the latter takes place, when the operation can be done soon enough, and, all other circumstances being equal, preferably in the interval of a succeeding attack, and when the tissues are not in an inflamed condition."

In chronic and recurrent appendicitis, where remedies fail to effect a cure, as they often do, and where the attacks are frequent and severe and the patient's general health is suffering, I think an operation between the attacks is advisable. Opium in any form can not be too strongly condemned. Yet there may be cases where the pain is so intense that from the standpoint of humanity alone we are finally compelled to resort to an anodyne even though we know it is not the best thing to do. In such cases I would use McMunn's Elixir. The alimentary tract and especially the colon should be thoroughly evacuated, but active cathartics and saline purges should never be used. I agree with Crutcher who advises to give "two tablespoonfuls of a mixture containing one part of glycerine and two parts of sweet oil every half hour until decided results are obtained. The soothing influence of sweet oil has been noted by scores of competent observers, and the addition of the glycerine renders it more palatable. Sweet oil may be given at intervals throughout the attack." Very often enemata of hot water are all-sufficient. If not, glycerine and sweet oil may be added. The colon should be thoroughly and persistently flushed if there are any evidences of accumulated fecal matter.

Therapeutics.—As has been before remarked, *Belladonna* (2x) is the remedy usually called for in the first stage of an acute appendicitis. In such cases we get the well-known characteristics of that drug; viz.: Full bounding pulse; high temperature; throbbing carotids; red face; hot skin; great pain in the ileo-cecal region; can not bear the slightest touch, even of the bed-covers; swelling and redness externally; nausea and vomiting; lies quiet on the back with limbs flexed.

If it is proposed to continue the medicinal treatment of the case, other remedies may be called for. *Merc. corr.* (3x) is generally required after *belladonna*. *Merc. sol.* (3x) is the first remedy to be thought of if an abscess is threatening but not yet established, the symptoms calling for *belladonna* having disappeared or become greatly modified. It will often cause absorption and dissipate an abscess.

The symptoms calling for *Mercurius* are: Painful, hard, hot and red swelling in the ileo-cecal region, painful to the touch; face red, or pale and sickly; tongue red and dry, or white and flabby; alternations of chilliness and heat; constipation, or frequent slimy discharges with straining; sweat without relief.

In case an abscess has formed and for any reason surgical measures are not adopted, *Hepar sulphur* (3x) is the next remedy to be thought of. The ileocecal region is swollen, deep and hard, in a circumscribed lump, and other evidences of a suppurative process.

Silica (6x), *Graphites* (6x), *Lachesis* (6.), and *Sulphur* (6x), may

be indicated in chronic suppurative cases. If peritonitis develop, consult the remedies recommended for that disease elsewhere considered.

INTESTINAL OBSTRUCTION.

Synonym.—Ileus.

Definition.—A complete or partial closure, either acute or chronic, of the intestinal canal.

Pathology and Etiology.—In the acute form of intestinal obstruction the closure is usually in the small bowel and develops rapidly. In the chronic form it is the large bowel that is obstructed, the development is gradual, and usually occurs in old people. Acute intestinal obstruction usually occurs either from (1) Strangulation; (2) Intussusception; (3) Volvulus or twists. Chronic obstruction results from (1) Unnatural accumulations, as fecal masses (coprostasis), foreign bodies, gall stones; (2) Tumors within or without; (3) Strictures, the result of cicatrization following cancers or ulcers. Rarely congenital stricture.

1. *Strangulation.*—This is the cause of one third of the cases of acute obstruction, and the most common cause in adults. Nearly three fourths of the cases occur in males during early adult life. Ninety per cent of cases occur in the right iliac fossa. The strangulation is usually produced by a loop of the intestines passing between adhesions, the result of a former and possibly remote peritonitis, and thereby becoming constricted; or the intestinal loop may pass through apertures in the mesentery or omentum, or through the foramen of Winslow, or into peritoneal diverticula and openings, or even through the diaphragm. In some instances the tip of Meckel's diverticulum becomes adherent to the mesentery or to the abdominal wall, thus forming a ring through which a loop of the intestine may pass and become constricted. Strangulation results in obstruction, sloughing, and eventually in perforation.

2. *Intussusception.*—Invagination is the most frequent cause of obstruction in children. It consists in a telescoping of the bowel, or one portion of the intestine slipping into an adjacent portion. The seat of the trouble is oftenest at the ileo-cecal valve, but is also found in the rectum. It is probably due to irregular peristalsis, the receiving layer being drawn up by contraction of the longitudinal fibers. Invagination is liable to follow any sudden and severe peristalsis. The attachment of a tumor within the bowel may cause a partial invagination. Intussusception always occurs downward. The parts involved soon become swollen and congested, and frequently ecchymoses occur. If, in recent cases, the peritoneum is only slightly congested, it may be possible to reduce the dislocation, but when the peritoneum has become agglutinated by inflammatory adhesions, reduction is no longer possible. In

very rare cases the diseased part sloughs and passes off per rectum, spontaneous recovery resulting. Perforation may occur. In rare instances invagination lasts for months without giving rise to acute symptoms.

3. *Volvulus*, or twists of the intestine, occurs oftenest in men, and between the ages of thirty and forty. About one half the cases occur in the sigmoid flexure of the colon, and less often in the cecal region. The twist is usually in the long axis of the intestine, and due to a long or relaxed mesentery, the twist occurring either in the mesentery itself or more often in the intestine. Sometimes one portion of the intestine is twisted about another. The twisting interferes with the circulation in the gut, and leads to necrosis of the affected portion.

As to the causes of chronic obstruction :—

1. *Unnatural accumulations*. — This includes fecal impaction (coprostasis) and foreign bodies. The former is a very common cause, and the latter only occasional. Impaction usually takes place in the cecum or sigmoid flexure. The fecal masses may entirely occlude the lumen of the intestine, or only partially so, leaving room for the passage of normal stools. Sometimes the accumulation is so large that it forms a readily recognized tumor. The longer the mass remains, the harder it becomes until it may even resist the edge of a knife.

Various foreign bodies, such as coins, buttons, fruit stones, may cause obstruction, a tangled mass of worms may be the foreign body. Under this head I would place indigestible articles of food. In one instance I knew of a physician, who, being in a hurry, made his lunch of bananas. They seemed to pass *en masse* entirely undigested, and caused, in this case, a severe acute obstruction. I have known cheese to do the same thing. Bismuth and magnesia have been known to accumulate in the bowel until they caused obstruction. Gall stones not infrequently enter the intestine through the duct, and either directly cause obstruction or become the nucleus of an enterolith. I saw one case where a large gall stone, carrying with it the gall bladder, sloughed out, and passed into the intestine, the patient having never known of the presence of gall stones. He died within a few days from acute obstruction. Thus it is seen that while the causes here enumerated mostly give rise to chronic obstruction, they may also cause the acute variety.

2. *Tumors within or without*. — There may be new growths within the intestine, or within its coats, especially epithelioma, or either benign or malignant tumors of the abdomen or pelvis, causing compression or traction from without.

3. *Strictures*. — These are usually cicatricial, rarely congenital,

and ordinarily due to the healing of ulcers and subsequent contraction of cicatrix. If the obstruction is in the colon, it is probably due to the cicatrization of dysenteric ulcers, and if in the rectum, usually syphilitic. Tuberculous and rarely typhoid ulcers may be followed by stricture of the small intestine. Obstruction is sometimes purely functional, arising from a paresis of part or all of the intestinal muscular coat. It usually results from some inflammatory process, such as enteritis or peritonitis. In such cases feces and gases accumulate, and give rise to pain, tympanites, vomiting and constipation. Functional obstruction may also occur in hysterical subjects.

Symptoms.—The three cardinal symptoms of intestinal obstruction are pain, vomiting and constipation, the onset of which may be either sudden or gradual. Usually the pain develops suddenly without previous ill health, and is localized, intermittent and colicky in its character. The patient feels that a bowel movement would relieve, and may pass, either normally or with the aid of an enema, the feces lying below the obstruction, but no relief is afforded, and after that, the constipation is absolute not even flatus passing, and does not yield to injections or the most powerful purgatives. In intussusception there may be discharges of mucus and blood. The pain soon becomes more intense, agonizing and continuous, and while retaining its original location, spreads over the whole abdomen, and tympanites develops. If the rectum is involved, there is distressing tenesmus. If the obstruction is high up in the small bowel, there may be hiccough and eructations. In either case vomiting is a constant and distressing symptom, at first alternating with painful retching. If, however, the obstruction be above the upper third of the ileum vomiting does not occur, but otherwise the higher up the obstruction, the earlier the vomiting occurs. The ejecta are at first gastric, then bilious and finally stercoraceous. If the obstruction be low down, the abdominal distention is much greater, and there is plainly visible an exaggerated peristalsis above the obstruction, which otherwise is not present. At first the abdomen is not sensitive, but later it becomes exquisitely tender. There is usually much borborygmus, and gurgling and splashing sounds may be distinctly heard.

Constitutional symptoms develop early. The face becomes pinched, pallid and anxious, with a Hippocratic expression; the skin is cool and moist; the pulse feeble and rapid; the respiration accelerated and shallow; the temperature usually subnormal, though occasionally there is fever; the thirst incessant; the urine diminished or suppressed. The symptoms of collapse increase, or those of peritonitis supervene, the patient rarely living beyond from five to ten days.

In chronic obstruction, there is usually a history of constipation, gradually increasing until becoming complete, though it may be weeks, oftener only a few days, before the serious symptoms consequent upon acute obstruction develop, which may either come on suddenly or gradually and with intermissions. If due, as is usually the case, especially in old people, to fecal impaction, there may be a channel formed through the fecal masses in the colon so that the fluid contents of the small intestine may pass through, and this may continue for a long time. The stools usually consist of small, hard balls, or scybalous masses, or ribbon-like bands. Often the rectum becomes distended from hard impacted feces, and the most persistent efforts at straining fail to relieve. Either colitis or peritonitis is usually developed.

If stricture exists, there may be a variety of symptoms existing for a long time and gradually developing to a complete obstruction. If the stricture be due to carcinoma, the characteristic cachexia and progressive emaciation gradually develop. Usually the impacted feces can be palpated from the outside, and the distention, tympanites, exaggerated peristalsis, etc., can be seen as in acute cases. Chronic obstruction may last for weeks or even months, the patient becoming emaciated and anemic, acute symptoms finally developing, and death resulting in from ten to twelve days.

Diagnosis.—The precise site of the occlusion can rarely be determined positively. If the obstruction be in the small intestine, vomiting occurs early, the higher up the earlier; the vomitus is scanty and later feculent; distention is less, there is no tympanites, and the urine is usually suppressed. If the obstruction be in the large intestine, there is less vomiting, and it is very rarely stercoraceous, distention and tympanites are marked, especially in the umbilical region, and active peristalsis is readily observed. If the rectum be involved, there is usually tenesmus and bloody mucous discharges. If it is found possible to inject four quarts of water, thus filling the colon and cecum, the obstruction must be high up in the small intestine. If a tumor or stricture cause the obstruction, the same can usually be discovered by palpation. If a deep-seated incarcerated hernia be present, it is usually only possible to detect it by means of an exploratory incision.

The recognition of the character of the obstruction is also often attended with great difficulty, and is sometimes impossible.

Intussusception usually occurs in children, and there is a sausage-shaped tumor in the right iliac region, sometimes in the umbilical region instead, and there are usually bloody mucous stools with tenesmus. Sometimes the intussusception may be felt in the rectum. Fecal vomiting is not common, and absolute constipation and abdominal distention are rarely present.

Strangulation occurs mostly in young adults. There is usually a history of a previous peritonitis or abdominal section. The pain is intense, vomiting is excessive, and soon becomes fecal, and there is rapid and extreme prostration. Constipation is absolute. There is no tenesmus. No tumor can be detected.

Volvulus can rarely be diagnosed except by an exploratory incision. If the trouble is at the sigmoid flexure, volvulus may be suspected. It should be borne in mind that twists are often produced by fecal accumulations and such a history might aid in the diagnosis.

Fecal impaction is usually readily distinguished by palpation and percussion of the colon, and rectal examination. There is usually a history of obstinate habitual constipation. Fecal vomiting comes on late and is not severe, as is also the case in regard to distention and pain.

Foreign bodies can not be definitely diagnosed. Gall stones may give rise to jaundice, and present a previous history of gall stone colic, but this is not always the case.

The various forms of abdominal colic sometimes lead to a suspicion of obstruction, as do the symptoms sometimes present in enteritis, but a careful study of the clinical history present is usually sufficient to establish a correct diagnosis.

Peritonitis, especially when following appendicular disease, is sometimes mistaken for obstruction.

Anders gives the following differential table:—

Acute Generalized Peritonitis. Acute Intestinal Obstruction.

Etiology.

There is a history of causal conditions or diseases (ulcer, appendicitis, pelvic infection).

There is a history of previous chronic obstruction or hernia (The age of the patient if it be intussusception).

Symptoms.

An early and considerable rise in temperature; later variable or may be absent.

No early rise (except in volvulus), but later with advent of peritonitis.

Pain more continuous and diffuse.

Pain in short paroxysms and localized.

Vomiting is characteristic, but not stercoraceous.

Vomiting becomes characteristically stercoraceous.

Collapse occurs later.

Earlier onset of collapse.

Slight increase of indican in the urine.

Excessive indicanuria, particularly when the small intestine is obstructed.

Physical Signs.

Distention of the abdomen is usually general and marked.	Less marked (sometimes partial), unless the obstruction be situated in the lower segment.
Visible peristaltic waves absent.	Present and pronounced when the seat of the obstruction is low.
Tenderness general.	Tenderness localized.
Signs of effusion appear.	Less common, due to secondary peritonitis.
Auscultation negative.	Loud gurgling and splashing sounds audible on auscultation.
Prognosis hopeless.	Not so if operated upon early.

Prognosis.—The prognosis is decidedly unfavorable. Chronic obstruction from fecal impaction, and cases due to functional disturbances often recover, the impaction being successfully overcome. In rare instances surgical measures are successful and the patient recovers. Spontaneous cures of intussusception and strangulation are recorded, but they are of exceedingly rare occurrence.

Treatment.—The treatment of acute obstruction must be prompt and energetic. There is no time to be lost. Purgatives must not be given under any circumstances. In most cases the pain is so excruciating that palliative must be administered; in which case hypodermic injections of morphine with atropine are preferable, as they also control to some extent the excessive peristalsis. Morphine should never be given by the mouth. The vomiting is best controlled by washing out the stomach three or four times a day, and allowing no food whatever.

“High rectal injections, copious, steady, and regularly repeated, are to be practiced, using for this purpose preferably a warm saline solution of oil (particularly if scybala be present) administered while the patient is in an inverted position, by means of a fountain syringe, so that the flow is readily controllable. The abdomen should be methodically kneaded (a valuable adjunct in the procedure) and the patient at times well shaken. This method of treatment, by hydrostatic pressure, can and must be carried forward without undue violence, and if it be unsuccessful, the intestines are to be inflated from a large India-rubber bag with air or hydrogen gas (Senn), of which two or three gallons may be cautiously introduced. Thorough manipulation of the abdomen from below upward, particularly if it be a case of intussusception, may be combined. In the latter condition inflation, early and perseveringly applied, cures in the majority of instances. In cases of intussusception or strangulation of the bowels, these efforts should be continued for twenty-four hours, when, if the condition is not relieved, immediate operation

is to be encouraged and advised. Although the statistics of Fitz show the mortality in cases without operation to be lower (69 per cent) than with operation (83 per cent), I am convinced from personal observation that the less favorable results from abdominal section would not obtain if it were performed in due time. To relieve the excruciating tympanites the plunging of a fine trocar and canula into the intensely distended bowel, as in case of volvulus, may be required." (Anders).

Indicated remedies are of little value as we have to deal with purely mechanical conditions. In chronic obstruction remedies are often of great value in controlling the various symptoms that may arise. In impaction of a functional character *Alumina* or *Opium* in the higher potencies often produce magical results.

CONSTIPATION.

Synonym.—Costiveness.

Definition.—Irregular, retarded, difficult and insufficient evacuation from the bowels.

Etiology.—Constipation may be due to a great variety of causes, chief of which are errors in diet and the habitual neglect of the act of defecation, from carelessness, want of time, or undue modesty. If the former, the use of a large amount of indigestible food, which forms dry feces, and the excessive use of coffee, are important factors. Constipation will also result from the habitual use of opium and from lead poisoning. Sedentary habits favor constipation, especially when accompanied by an irregular and injudicious diet. It may be brought about by any of the causes which produce weakness of the muscular fibers of the intestines: anemia, chlorosis, and other enfeebling diseases, chronic enteric catarrh, the habitual use of purgatives, or, more often, dilatation of the bowels from habitual neglect, thus resulting in deficient peristaltic action. Constipation may also result from an abnormal loss of fluids by perspiration, diuresis, or excessive lactation, rendering the feces preternaturally dry; from an inactive state of the rectum; from ovarian or uterine derangements, which partially account for the special predisposition to constipation in the female sex; from hepatic derangements; from various chronic affections, especially those connected with the nervous system. Constipation may also arise from mechanical obstruction, the presence of tumors or a displaced uterus, foreign bodies, large masses of scybala and strictures of all kinds.

Pathology.—Constipation, in the sense in which it is usually considered, may not always constitute an abnormal condition. Ordinarily, a person should have one free evacuation each day to be in good health, yet this is not an invariable rule, as many persons who enjoy

good health have two or three evacuations daily, or, on the other hand, only defecate once in every few days. In fact, instances are not as rare as may be supposed of persons who habitually go from four to six weeks without an evacuation. In my article on constipation in Arndt's System of Medicine, written in 1884, I reported a case of this kind that had then been under my observation twelve years. This patient is still living, about sixty-four years of age, and is in excellent health. He is a stone mason by occupation, whose habits of life have, with the exception of the use of tobacco, been very simple and regular, and whose health has always been unusually good since his youth, has not had evacuations from the bowels oftener than once in six weeks, and when occurring oftener than this, they have caused him more or less discomfort. This is quite an unusual case, from the fact that the prolonged retention of feces appears to be entirely habitual, and does not appear to affect his health. It is quite apparent that what constitutes an abnormal retention of feces in one person may not be so in another. The most important pathological changes which characterize constipation are those which naturally result from the irritating presence of the retained hard and dry feces, redness and congestion of the mucous membrane being the first, and sometimes the only, symptom produced. This congestion may, however, go on to inflammation, ulceration, and even perforation of the bowel, which is first greatly dilated and hypertrophied. Such instances are perhaps rare, the most common result being a retardation of blood in the hemorrhoidal veins, giving rise to hemorrhoidal tumors.

Symptoms.—In addition to the symptoms of retained feces, constipation may give rise to a long train of subjective phenomena so varied in character that they can hardly be compassed in this article. Local uneasiness, pressure or weight in the perineum, a sense of abdominal distention, flatulence and colicky pains, together with dullness of the intellect, headache, languor, palpitation, furred tongue, bad breath, loss of appetite, with general dyspeptic symptoms and the usual phenomena attendant upon a too prolonged retention of the feces, while severe straining at stool may cause cerebral hemorrhage and hernial protrusions. Sometimes the difficult defecation is accompanied by much pain, and leaves behind more or less aching, burning and soreness in the anus from the passage of the hard mass of feces, which not unfrequently so irritates the mucous membrane as to produce dysenteric symptoms. The general effects upon the system are sometimes well marked. The nervous system becomes depressed and irritable, and anemia and emaciation may result from the disturbance of the nutrition.

Diagnosis.—The diagnosis of constipation rarely presents any

difficulty. If the accumulation of the retained feces is very large, it may simulate an abdominal tumor, or by its irregular character may lead to suspicion of a cancerous mass. It should be borne in mind, however, that the enlargement, if due to fecal accumulation, will correspond in form and position and shape to the cecum or to some part of the colon, and will usually have a slight doughy feel, yielding to pressure, and retaining its altered shape after the pressure is removed. In such instances resort should be had to the thorough use of enemas before a positive opinion is given.†

Prognosis.—When constipation is not due to incurable diseases or to mechanical obstructions which can not be removed, or has not progressed to a point where ulceration is extensive and perforation threatening, a favorable prognosis may always be given. Much of the result of treatment, however, will depend upon success in controlling the habits of the patient, and upon enforcing proper dietetic regulations, without which, in most cases, little can be accomplished.

Treatment.—It is comparatively seldom that constipation occurs primarily, except from errors in diet and irregular habits, such as have been enumerated. In such cases it is only necessary to enforce such rules of diet and living as are best adapted to the individual. Prompt obedience to the calls of nature and a judicious system of diet are usually sufficient to prevent the occurrence of constipation. Too much importance can not be attached to the habit of regularly and systematically attending to the calls of nature. Daily, at some convenient hour, perhaps soon after a meal, at which time there is a natural tendency to peristaltic movements, the patient should retire to the closet, and at least solicit an evacuation, though not persist in fruitless efforts by violent straining. Plenty of time should be allowed, and no excuse be permitted to interfere with the performance of this important duty. At first, there may seem to be no beneficial result, but after a time, if the habit is persevered in, nature will respond. It is probable that without the strict observance of this rule no case of habitual constipation can be permanently cured. The necessities of nature, from press of business or from notions of false delicacy, are too often neglected, especially in the case of girls attending school, or in those who are employed as saleswomen, clerks, and seamstresses in large establishments where proper and convenient resorts are not provided.

In the matter of *diet* the use of oatmeal and cracked wheat, or bread made from "graham" or bran flour, together with laxative fruits, such as apples, figs and prunes, are the most important. Often, the adoption of such a diet, with the free use of such vegetables as leave after digestion a bulky residuum—cabbage, lettuce, etc., is all that is required

to overcome habitual constipation. A ripe apple or a glass of water taken in the morning before breakfast is very beneficial. Drinking a cup of hot water several times each day often cures after other measures have failed.

It is often necessary to resort to enemas, which may be used at the same hour daily, in conjunction with the appropriate homœopathic remedy, until the action of the latter renders the enema unnecessary. It is no doubt true that the long-continued use of enemas tends to produce paresis of the rectum, or, at least, the rectum grows so accustomed to the fecal distention that after a time it fails to excite the peristaltic action, and the enema becomes of comparatively little benefit. To empty the rectum it is better to use glycerine, soap or gluten suppositories, or to inject a tablespoonful of glycerine in one-half cup of warm water. Hale says, "A little boric acid placed just inside the sphincter by means of a powder-blower or the finger, is often quickly followed by a stool." *Physical exercise*, such as walking, or riding horseback, not carried to excess, is of much benefit, and friction over the bowels, made with a flesh-brush, or crash towel, should be liberally practiced.

Anders recommends *massage* as "an important aid in the relief of habitual constipation. It acts by stimulating the peristalsis and the abdominal muscles, and should be employed at set times in the day preceding a desired evacuation of the bowels. The hand of the *masseur*, or that of the trained patient even, when systematically used in this way, may be effectual when all other means have failed. The regular rolling of a metal ball along the course of the greater gut may be mentioned for its novelty as well as for its undoubted efficacy. The application of the faradic current to the abdominal walls or galvanization of the lumbo-abdominal circuit, deserves proper trial in many cases. *Hydro-therapeutic* measures, or cold sponging and baths, are nearly always useful adjuncts in the treatment of this often stubborn affection." In the use of electricity the sinusoidal current is most effective. The wholesale use of any and all forms of cathartic medicines is at all times to be condemned, as in the long run they only result in general injury to the system, and confirm the constipation. Laxatives should only be used in emergencies, and where it seems necessary to secure a prompt evacuation. At such times the natural laxative mineral waters are best.

Therapeutics.—**Nux Vomica** (3x to 30x) is especially indicated in persons who lead sedentary lives; who are irritable and hypochondriacal; who freely use coffee or liquors and purgative medicines, and are subject to hemorrhoids; the feces are large and hard — frequent and ineffectual desire for stools; headache, especially in the morning; unre-

freshing sleep; dyspepsia. The constipation of *Nux vomica* is due to an irregular or spasmodic action of the intestine, and not to inactivity.

Bryonia (3x to 30x).—Stools large, hard and dry, as if burnt; passed with great difficulty; bitter taste in the mouth; tongue thickly coated white; pressure as from a stone after eating; disposition to headache, with irritability and anger of the patient. *Bryonia* is often a most effective remedy in chronic constipation.

Opium (30x).—Inactivity of the bowels; no desire whatever for stool; stools composed of hard, round, black balls; no inconvenience from the accumulation, on account of the insensibility in the parts; incarcerated hernia; lead poisoning; obstipation after acute diseases.

Alumina (6x to 30x).—Inactivity of the rectum; even the expulsion of soft stool requires great straining; no desire for stool and no ability to pass it until there is a large accumulation; stools hard and knotty, like sheep-dung, with cutting in the anus, followed by blood; constipation in nursing children; from lead poisoning.

Lycopodium (30x).—Ineffectual urging, owing to contraction of the rectum, which protrudes during stool; small stool, with sensation as if much remained unpassed; large accumulation of gas in the bowels, with much rumbling; torpor of the bowels; in nursing children and in elderly people.

Plumbum (6x).—Stools small, hard, in lumps or balls, like sheep-dung; colic; retracted abdomen; painful contraction of the anus; when *Opium* is indicated, and has failed.

Sulphur (30x).—Stools scanty, difficult and insufficient; hard as if burnt, ineffectual urging; itching and pressure in rectum during a stool; burning in anus after stool; habitual constipation, especially in persons subject to hemorrhoids or in scrofulous persons.

Collinsonia (2x).—Constipation associated with or dependent upon hemorrhoids, and when it gives rise to functional disturbances of the heart. Stools light colored and lumpy, with hard straining, followed by dull pains in the anus and hypogastrium; stool in form of balls.

Hydrastis (1x).—This is a remedy highly prized by many in habitual constipation. Hughes considers it superior to *Nux vomica* as ordinarily prescribed. Like that drug it is especially useful after the abuse of purgative and laxative medicines. Gastric and hepatic symptoms are usually present. The stools are usually hard and coated with mucus. There is also usually a sinking, gone feeling in the epigastrium, frontal headache and eructations.

Consult also *Esc. hip.* (6x), *Anmon. mur.* (30x), *Calc. carb.* (30x), *Graph.* (6x), *Magnes. mur.* (6x), *Nitric acid* (3x), *Phos.* (6x to 30x), *Platina* (30x), *Silicea* (30x), *Zinc.* (30x).

ENTERALGIA.

Definition.—A neuralgic affection of the intestines, which is characterized by paroxysms of intense, sharp pain, lacking the griping and twisting nature of colic pain, from which it is often distinguished with much difficulty.

Etiology.—A nervous diathesis is the most important predisposing element, but, as in colic, we find that age and sex exert an important etiological relation. The disease is most likely to occur during adult age, and especially in women, in whom it is often associated with ovarian and uterine disorders and hysterical conditions. In general, it may be said that all those predisposing elements which tend to produce neuralgic conditions elsewhere, are equally potent here.

Enteralgia is strictly a visceral neuralgia, and the same character of constitutional causes are required to produce it, which are capable of producing any other form of neuralgia. Heredity is an important factor. The various dyscrasiæ, such as malaria and syphilis, are undoubtedly causative. Any condition of lowered vitality or a depressed state of the bodily functions, anemia, neurasthenia, or the exhaustion of nerve force induced by sexual excess, and gouty rheumatic conditions, are predisposing causes. So also weakness, resulting from acute, or more especially from long-lasting chronic diseases, by impairing the tone of the nervous system predisposes to enteralgia. Especially is this the case in those affections in which there is, or has been, a continued loss of the vital fluid, as in menorrhagia and other hemorrhages, or when there has been excessive lactation or a prolonged lochial discharge, or a profuse leucorrhea, or any wasting discharge. In short, anything tending to deteriorate the blood, and to depress the nervous system, may produce enteralgia. Enteralgia is frequently of reflex origin, as when it occurs in connection with hysteria. Its occasional association with caries of the vertebræ, and affections of the spinal cord also serves to establish its reflex origin. This may also be a factor in its connection with Bright's disease and other structural lesions, but it is more than probable that the contamination and alteration of the blood in these pathological states is sufficient to account for the tendency to neuralgic disturbance often found associated therewith.

Indigestion and constipation may excite an attack of enteralgia. The use of indigestible food, or conditions of the system which cause a partial failure of the digestive processes, or the presence of impacted feces, or flatulence, may produce a neuralgic condition; but these cases partake largely of the character of an intestinal colic, and should be distinguished from enteralgia.

Lead Colic, also known as painter's colic, plumber's colic, colic of Poitou, and colica pictorum, is distinctly a neuralgic affection, and should be so considered. It is caused by the absorption of lead into the system, and occurs among painters, plumbers, white-lead makers, and lead-paint manufacturers, type founders, compositors, and others who work in an atmosphere which is loaded with particles of lead. In a comparatively rare number of cases, lead colic is caused by ingesting food or drink containing lead, or by using medicinal preparations of lead.

Symptoms.—Romberg describes enteralgia as follows: "There are attacks of pain spreading from the navel over the abdomen, alternating with intervals of ease. The pain is tearing, cutting, pressing, most frequently twisting, pinching, introduced and accompanied by peculiar bearing-down pains. The patient is restless, and seeks relief in changing his position and in compressing the abdomen; his hands, feet, and cheeks are cold; his features are pinched, the wrinkled brow and contracted lips betray his agony. The pulse is small and hard. The skin of the abdomen is tense, whether puffed up or drawn inward. There are often nausea, vomiting, and desire for stool. Sometimes there is also tenesmus. There is usually constipation, but sometimes the bowels are regular, or even too loose. Such an attack may last from a few minutes to several hours, relaxing at intervals. It ceases suddenly as if cut off short, and there is a feeling of the greatest relief. The course is periodical, but less regularly so than in other neuralgias."

When enteralgia occurs in connection with other diseases, it may only be considered as a symptom, and its characteristics are modified according to the nature of the affection which has produced it. So does the duration of the disease vary, according to the nature of its fundamental cause, from a few minutes to several hours, or days, sometimes ceasing with a single paroxysm, and again continuing with more or less regular intervals for an indefinite period.

In lead colic the symptoms are usually developed gradually, being preceded by, or coincident with, symptoms of lead poisoning. The patient is anemic, the skin looks dirty and earthy, the gums are dark, the teeth discolored, the breath fetid, and the patient complains of a sweetish, metallic taste in the mouth. The discoloration of the gums is an important indication, and occurs in a large majority of cases. It appears on the gums at their junction with the teeth, and is of a blue or slate-gray color. It not only occurs before the attack, but usually remains during the continuance, and even after the cessation of the disease. The pain is at first slight, and extends from the epigastric or the umbilical region around to the back and extremities. This grad-

nally increases, and, though at first dull, often becomes acute and lancinating in its character, the patient uttering loud groans and cries, and assuming various unnatural and often absurd positions. The abdomen becomes retracted, hard and resisting from tonic contraction of the abdominal muscles; the pulse becomes slow, the voice hoarse, the skin cool; nausea, vomiting and hiccough are not uncommon; strangury may occur; the mind is anxious and depressed. There is almost always obstinate constipation, with stools consisting of small, hard lumps or round balls.

In exceptional cases the abdomen is tympanitic, and pressure causes an intense aggravation, but usually the retraction, which is considered pathognomonic, is present, and hard pressure temporarily relieves the suffering, though light pressure may aggravate it. Often there is found a coexisting paralysis of the exterior muscles of the forearm, known as "wrist drop." The course of the disease presents a remittent type, the paroxysms giving way to more or less lengthy intervals of comparative ease, the patient being at times entirely free from pain; usually the pain does not entirely disappear. The duration of the attacks varies, sometimes lasting only a few hours, never to recur, while in others, relapses at irregular intervals are prone to occur, and may continue for an indefinite period.

Diagnosis.—The symptoms of enteralgia are so characteristic that it is not usually difficult to distinguish it from other affections. It may be confounded with intestinal colic, but if we bear in mind the causes, and take into consideration the constitutional, predisposing elements which may be present, an error should not often be made. Many authors make no distinction between enteralgia and intestinal colic, and since the treatment is in most cases essentially the same, a mistake in the diagnosis might not be a serious matter. It is safe to say that the causes of enteralgia are usually of centric origin, while those of colic are more likely to be local or peripheral. The pains are more darting than those of colic, and partake less of the griping or twisting character.

Enteralgia is easily distinguished from enteritis and other inflammatory affections by the absence of the local and general signs of inflammation. The pulse remains unaltered, the skin cool, the tongue moist, there is no thirst, the bowels are constipated, the abdomen, if distended by flatulence, is not sensitive, and pressure may even perceptibly relieve the suffering; the pain moves about from place to place, while in inflammation it is stationary. When the attack is due to lead poisoning, the symptoms are remarkably pronounced and can not be mistaken.

Prognosis.—The prognosis is always favorable, and even the

most inveterate cases of lead colic do not prove fatal. When a patient dies, presumably from enteralgia, it will be found that this condition was only secondary to some structural disease which had been overlooked during life.

Treatment.—The *preventive treatment* of enteralgia consists in applying such measures as would tend to remove the predisposition of the system to neuralgic affections. The use of nourishing food, together with proper exercise and an abundance of sunlight, the proscription of all excesses, especially sexual, and the adoption of the usual methods for the restoration of the tone and vigor of the system, are essential. In cases of lead colic, the continued exposure to the poison must be avoided, even if the patient be compelled to suspend his occupation. If the source of the poisoning be obscure, it should be sought for until found, and removed. Persons obliged to work in an atmosphere charged with lead may do much to ward off lead poisoning by having the apartments well ventilated, bathing the body frequently, and carefully cleaning the mouth and teeth. Such persons should employ a diet of fruit and vegetables, with oatmeal and graham flour, in order to keep the bowels in a healthy condition without the aid of purgatives. Drinking largely of milk, or, it is asserted by others, the use of sulphuric acid, acts as a prophylactic and antidote in lead colic. A drachm of dilute sulphuric acid in a quart of sweetened water may be taken in the course of twenty-four hours. A nourishing diet is of the utmost importance, and animal fats are especially desirable.

Persons suffering with enteralgia should be well protected from cold and atmospheric changes by dressing warmly, wearing flannel next the skin, throughout the year. Rest is of the utmost importance, and should be strictly enforced as an essential condition to a permanent cure.

Hot fomentations and a copious enema of warm or hot water frequently give immediate relief.

In cases where the pain is violent, and relief is not obtained from the remedies given, chloroform may be administered internally, and also applied externally, either alone or combined with laudanum. If this still fails to relieve, recourse should be had to the hypodermic use of morphine.

Therapeutics.—**Nux Vomica** (3x).—Enteralgia arising from indigestion or from overeating; in persons of sedentary habits, or in those who dissipate; hypochondriacal mood; oversensitive; great dread of and incapacity for literary work; irresistible sleepiness during the day, especially after meals, but wakefulness at night; pains periodical after breakfast or after meals; relief from bending double; constipation; characteristic headache.

Colocynth (3x).—Enteralgia from cold, or from excessive use of fruit. Pains occur in paroxysms; contractive, twisting, griping, cutting pains, mostly about the umbilicus; has to bend double, being worse in any other position; better by pressing some hard substance against the abdomen; great restlessness, and loud screaming on changing position; relief from coffee and smoking tobacco, and from the passage of flatus; other food and drink aggravates.

Dioscorea (1x).—Constant dull, heavy, or cutting, griping, twisting pains in the abdomen, which do not intermit, and are relieved by stretching the body out, bending backward, or, by walking about, being aggravated by rest. The pains in the abdomen suddenly shift and appear in distant localities, as in the fingers and toes; hyperesthesia of the abdominal nerves. Stools dark colored, bilious, very offensive; constant, ineffectual desire for stool.

Arsenicum (3x).—Due to malarial influences, or some constitutional cachexia, or organic disease; also in cases coming on suddenly from drinking ice-water or eating ice-cream. Violent, periodical burning or cutting pains, with intolerable anguish and restlessness; great weakness and prostration, the strength suddenly sinking. Pains usually worse at night, after eating and drinking, and better from warm applications; nausea, vomiting, and dark-colored, watery, offensive diarrhea; sometimes constipation.

Belladonna (2x).—Sensation as if a spot in the abdomen were seized with the nails, a griping, clutching, clawing pain; violent, cutting pressure in abdomen, now here, now there; the pain comes on and disappears suddenly; tenderness to slight pressure, but relieved by hard pressure across the abdomen; worse after 3 P. M., and after midnight; tendency to cerebral congestion; thirst, but drinks little, as drinking aggravates.

Chamomilla (3x).—Peripheral neuralgia; griping, tearing pain in region of navel and lower down on both sides, with pain in small of back as if broken; flatulence; the abdomen is distended like a drum; flatus passes in small quantities, without relief; better from warm applications; sensation as if the bowels were drawn up in a ball, and as if the whole abdomen were empty; pains appear at night or in the morning after eating, or from anger.

Alumina (6x).—Lead colic. Spasmodic pains in hypochondria and stomach, with dyspnea, or passing down in the groins, like hernia.

Cinchona (2x).—Enteralgia from malaria, from sexual exhaustion, loss of vital fluid, or from the passage of gall stones. Pain in hepatic region as from subcutaneous ulceration, worse from touch; violent,

pinching pain, relieved by bending double, returning every afternoon or at night; tympanitic distention of the abdomen.

Coffea (30x).—Excessive pains as if the abdomen would burst, driving to desperation; great nervousness; suffocative fits; convulsions.

Cuprum (3x).—Violent, intermittent, cutting, drawing pains; cramps in the abdomen; abdomen drawn in and sore to the touch; spasmodic movements of the abdominal muscles; restless tossing about and great uneasiness, with piercing screams; aggravated by drinking cold water.

Magnesia phos. (3x).—Pains intermittent, relieved by bending double, by rubbing, by external warmth and by eructations. Especially useful in colic of infants, where the legs are drawn up.

Opium (3x).—Lead colic. Violent griping and cutting in the abdomen; pressive pains, as if the intestines would be cut to pieces; abdomen hard and distended; constipation from inactivity of the bowels, and from spasmodic retention in the small intestines, retention of urine.

Platina (6x).—Lead colic. Pressing, bearing-down pain in abdomen, extending into the pelvis; the patient screams, and tries to relieve the pain by turning in all possible positions.

Plumbum (6x).—Excruciating pains in umbilical region, shooting to other portions of the abdomen and body, somewhat relieved by pressure; abdomen retracted to the spine, as if drawn in by a string; recti muscles hard and knotty; better from rubbing or hard pressure; obstinate constipation.

Consult *Aconite* (2x), *Asaf.* (3x), *Cocculus* (3x), *Colch.* (2x), *Ignatia* (3x), *Iris vers.* (1x), *Lycop* (6x), *Merc. sol.* (3x), *Phos.* (3x), *Puls.* (3x), *Rhus tox.* (3x), *Sepia* (30x), *Stannum* (6x), *Verat. alb.* (2x), *Zinc.* (6x).

INTESTINAL PARASITES.

Synonyms.—Intestinal Worms, Entozoa, Enhelminthes, Helminthiasis.

Varieties.—There are eight varieties of animal parasites that inhabit the human intestinal canal. Of these, three belong to the order of Cestoda, or tape-worms, and five to the order of Nematoda, or round worms.

Cestoda.	{	Tenia solium.
		Tenia saginata.
		Bothriocephalus latus.
Nematoda.	{	Ascaris lumbricoidis.
		Oxyuris vermicularis.
		Trichina spiralis.
		Trichocephalus dispar.
		Anchylostomum duodenalis.

Ordinarily but one of these varieties infest the human intestines at the same time, though many cases are reported where two or more have been found in the same subject.

Cestodes or Tape-worm. Tenia. — *Description.* — The *tenia solium* is from six to thirty feet in length, has a globular head or scolex, a slender neck connecting its numerous flat segments or joints. The head, or scolex, measures about $\frac{1}{40}$ of an inch, has a double circle of hooklets, — whence the term “armed tape-worm,” — and is provided with from two to four suckers. The segments, or joints (*strobila*), are flat, and vary from one eighth to one half an inch in length, and each contain both male and female sexual organs, the uterus being a long, numerously branched tube, in which the ova develop; the ova measures about $\frac{1}{1000}$ of an inch in diameter. An ordinary tape-worm contains some five million ova. The parasite is firmly imbedded in the mucous membrane of the upper third of the small intestines by its hooklets and suckers.

The lower or terminal segments represent the adult and complete animal, and are termed the *proglottides*, which separate from the parasite, and are discharged either alone or with the feces.

The *tenia saginata* is from ten to forty feet in length, has a rounded or oval-shaped head, measures about one tenth of an inch, and has four strong and prominent suckers, but *no* hooklets, — whence the term “unarmed tape-worm;” the neck is short and thick and the segments are larger, stronger and thicker than those of the *T. solium*.

The *Bothriocephalus latus* is the largest of the three Cestoda, the length ranging from fifteen to sixty feet, the head oval, measuring about one tenth of an inch, a short neck, the segments or joints being nearly three times as broad as they are long. Its color is a dull bluish-gray.

Etiology. — In the first place in considering the etiology of intestinal worms, it must be remembered that the theory of spontaneous generation from deranged intestinal conditions is now a thing of the past. The eggs or embryos must be introduced into the system from without, nor will an intestinal worm develop in the bowel directly from an ovum deposited there by a previous tenant, but it must first be discharged and undergo metamorphosis, being afterward conveyed by some means through the mouth into the alimentary canal in a certain stage of development; when the parasite thus reaches its peculiar habitat, it grows into the adult animal.

Accurate observation and experiments have established the fact that the Cestodæ are cystic entozoa, known as *cysticerci*, in a state of maturity. Different varieties of cysticerci are found in the solid parts

of different animals, and each variety, received into the alimentary canal of another animal and there finding favorable conditions, becomes a perfect tenia, each kind of cysticercus becoming a particular kind of tenia. A cysticercus, on the other hand, is the product of the ovum of a tenia. The last links of the tenia, known as proglottides, which contain the ripe eggs, occasionally drop off and are evacuated.

In order to develop further, the embryos from the eggs must enter some other animal. If they are swallowed by some animal, they pass from the intestines into the tissues of the body, till they find a suitable place; then they throw off the little hooks, and a neck and head (scolex), resembling those of the tape-worm, grow from their wall. At first the scolex is inclosed within the embryo; it subsequently becomes free, and the swollen body of the embryo hangs to it like a bladder. This constitutes, at this stage, the cysticercus, or bladder-worm, such as is seen in the muscles, liver, brain, and other organs and tissues of different animals, and sometimes in human beings. The most common variety of cysticercus is that found in the swine, called the cysticercus cellulosus, which constitutes the scolex of the tenia solium. The scolex of the tenia saginata is found in beef, and is usually termed the cysticercus medio-canellata. The scolex of the bothriocephalus latus, or tenia lata, has more effectually eluded investigation, but is supposed to exist in fish or mollusks. If one of these scolices enters the intestines of a human being, it becomes attached by the head to the wall, drops the bladder-like tail, and then a succession of segments form, constituting the tape-worm. They are generally introduced by eating the raw or imperfectly cooked flesh of the animals which they infest. Thus the tenia solium results from eating pork, while the tenia saginata is acquired by eating beef, and it is supposed the tenia lata from eating fish or from drinking water into which the larvæ have been deposited. Occasionally, the cysticerci may be introduced with other articles of food which have been in contact with the infected meat. Tape-worm is far more frequent in those countries where much pork is eaten; and persons who do not eat pork, as the Jews, are particularly exempt from the disease. Tenia saginata is the variety mostly found in England and America, as might be expected from the large amount of beef consumed, though the tenia solium is of not unfrequent occurrence. The tenia saginata is most prevalent in Africa and Asia. It is said that the Abyssinians, almost without exception, are infested with this variety, and it is well known that the use of the raw, still quivering cow's flesh is looked upon by them as the greatest delicacy. The bothriocephalus is prevalent in eastern Europe as far as the Vistula, especially along seacoasts and rivers, and in Switzerland. The habit

of feeding children and invalids with raw beef has been known to produce tape-worm. Cysticerci can not withstand boiling, roasting and smoking, and infested meat thus treated in a thorough manner never produces tape-worms.

Pathology.—The disorders generally caused by tenia are simply functional, and such as result from the irritation to the mucous surface by the movement of the tape-worm. Leuckart has shown by observations on the dog that local congestions of the mucous membrane, separation of the epithelium, and even minute superficial sores may occur, and we have reason to infer that similar changes take place in man, though as yet they have not been demonstrated.

Symptoms.—The symptomatology of tape-worm is quite indefinite, and often exceedingly obscure. Probably, in a majority of cases, there occur no symptoms whatever until fragments of the worm are passed at stool. There are, however, functional disturbances, already mentioned. Frequently, patients will complain of a severe twisting pain in the abdomen, like colic, and will bend double, or press the abdomen against some hard substance, suffering from nausea and sometimes vomiting. They may also have more or less itching about the nose and anus, disturbed sleep, anorexia, or a voracious appetite, frequently followed by fainting if not satisfied, and diarrhea alternating with constipation, headache, ringing in the ears; the disposition is fretful, and the mind greatly depressed. As a rule, all these symptoms are worse when fasting, and are at once mitigated by eating.

In addition, there exist sympathetic disturbances which sometimes assume a grave character, hemorrhages, menstrual irregularities, hysterical fits, chorea, convulsions, and even epileptic and maniacal attacks. These, however, are so liable to occur from other causes coincident with the tape-worm that they should be received with much caution, and frequently they do not disappear long after a tenia has been discovered and dislodged.

Diagnosis.—It is not only quite important to recognize the actual presence of a tape-worm, but it is also important to distinguish the variety, in order to anticipate the amount of resistance to measures of relief, a fact often overlooked by the average physician. From a diagnostic point of view, the symptoms already described are of but little importance, as they are by no means characteristic of worms, so that we are unable positively to predict their existence until it is known that the proglottidis has been expelled. Segments of the tenia saginata are usually expelled spontaneously, but this is seldom, or never, the case with the tenia solium, it often being necessary and justifiable, in strongly suspected cases, to administer a purgative in order to secure

the segments for examination and diagnosis. The segments of the tenia solium are much thinner, softer and more transparent, and the lateral branches going off from the uterus are only from nine to twelve in number, while the tenia saginata has from fifteen to twenty. The segments of the bothriocephalus are seldom expelled singly, but usually several joined together, and in each may be seen a brown spot formed by the uterus, which is not shown in the other varieties.

Prognosis.—The prognosis is always favorable, there being no reason why the worms should not be dislodged if properly treated. It is necessary to insure the discharge of the head, else a further growth will probably take place. Tape-worms may infest the bowels for many years, yet no serious consequences ensue, as a parasite seldom destroys the life of the animal from which it derives its own subsistence. Sometimes, by their migrations, or by causing obstruction of the bowels, worms may become dangerous, and death may occur in children from reflex convulsions excited by their agency.

Treatment.—From our present knowledge of the causes which give rise to tape-worm, it is quite evident that the only preventive measures consist in an abstinence from the use of raw or imperfectly cooked meat. As has been stated, the cysticerci can not withstand boiling, roasting or smoking, and meat so treated can not produce tape-worm. In countries where the bothriocephalus latus is found, it is necessary to avoid the use of impure drinking water, especially that coming from sources where fish abound. The first step in treatment is to rid the system of the invader, after which the symptoms which have resulted from its presence, or which may have been produced in the efforts made to dislodge it, are to be removed by the use of the indicated homœopathic remedy, together with such a diet as the individual case seems to demand.

Before administering the tenicide, the patient should be placed on a low diet for a few days, avoiding such articles of food as are digested in the small intestines, and eating only beef-tea, chicken-soup, milk, toast, or some light food which leaves little residuum. German physicians put their patients on a diet of onions, garlic, and salt-herring, for the reason that these articles are known to be obnoxious to the worm. The medicine may then be administered, and after a few hours an active purgative given to expel the dead parasite. In case the head is not discharged there is no certainty of the success of the treatment, but further means for its removal should not be employed until fragments of the worm are again discharged. *Male fern* or *Filix mas* is the oldest and probably most popular tenicide. It is best administered in capsules containing one half to one drachm of the

ethereal extract. The oil may also be given in drachm doses, in mucilage with milk.

The bark of the *pomegranate root* (*Punica granatum*) is an excellent tenicide. The fresh bark only should be used. About two and one half ounces should be boiled in a pint and a half of water until the quantity is reduced one half, this amount being taken in three doses within an hour. Kückenmeister strongly advises the addition of twenty or thirty grains of the ethereal extract of male fern. The tannate and sulphate of pelletierine, the active principle of the pomegranate, have both been successfully used to remove the tape-worm, and at present writing are the most popular. One to five grains may be given in an emulsion. *Kousso*, the flowers and tops of the *Brayera anthelmintica*, a tree of Abyssinia, a country where the tape-worm abounds, is considered an effective tenicide, and is much used for the species there prevalent. It has also been used with success in Europe and America. It may be given in doses of one-half ounce of the powder. Heller prefers to give it in compressed balls or disks coated with gelatine. He considers five drachms necessary for the *tenia solium*, and seven and a half drachms for the *tenia saginata*. The balls or disks should be placed on the back part of the tongue and swallowed alone, or by the aid of some coffee. After this, the tendency to vomiting should be resisted, with the assistance of lemon-juice, mustard applied to the epigastrium, bits of ice swallowed, and by maintaining the recumbent position. He advises an ounce or two of castor oil, two hours later, to expel the worm speedily and entire. Koussin, an alcoholic extract, is now used by some in thirty-grain doses, instead of the crude drug.

Kameela, the glandular powder and hairs from the capsules of the *Rottlera tinctoria*, is an efficient, and not unpleasant tenicide. It may be given in doses of from one to three drachms, prepared in a gum-arabic emulsion, and repeated every three hours if necessary. No purgative is required to follow. If two or three doses do not prove effectual, add about one drachm of the oil of male fern, and repeat.

Pepo semen, an emulsion of pumpkin-seeds, is ranked in this country as one of the best tenifuges. It possesses the advantage of producing no unpleasant, injurious effects. The emulsion is prepared by rubbing up about two ounces of the fresh seeds in a mortar with a pint of water, and straining through a cloth. To this a drachm of sulphuric ether should be added, and the whole quantity taken at one dose in the morning on an empty stomach. If the first dose is not effectual, it may be repeated each morning for several days.

Turpentine is an efficient tenicide, but its unpleasant taste and the ill effects following its use have prevented its general employment, save

in cases which have resisted other methods of treatment. It may be given in half-ounce doses every half hour until two ounces are taken. Bartholow advises uniting with it an equal amount of castor oil. It is probable that any of the medicines before mentioned are equally effectual, and less injurious to the system.

Naphthalin is very recently known as a tenifuge. Goodno says he has "used it successfully, administering ten-grain doses before meals for several days before and after the expulsion, the latter being accomplished by the administration of thirty grains in the morning, followed by a cathartic three hours later. The powdered crystals are not unpleasant, and may be washed down with a little water.

NEMATODES, OR ROUND WORMS.

Description.—Ransom describes this order as "elongated, slender, often thread-like worms, not distinctly jointed, or provided with appendages; with a separate alimentary canal, a terminal mouth, an anus near the caudal extremity, opening on the ventral aspect. The integument is marked by two longitudinal bands, and often by a dorsal and ventral one; in the former are imbedded the nerves, with their ganglia and the excretory tubes, which open in the surface about the level of the pharynx." "The female aperture is placed about the central region of the body, that of the male near the anus, and conjoined with it; it is furnished with retractile spiculæ, usually two or more. The male is smaller than the female. The development is direct, and the metamorphosis inconspicuous, so that the embryo has the general aspect of the nematode worm. The order is rich in species, and furnishes as many parasites as all the other Helminthoids put together. They infest invertebrata as well as vertebrata, and no organs escape their invasion."

The *ascaris lumbricoidis*, or round worm, is the most common of all intestinal worms, and exists most often in children between three and ten years of age. It is elongated, cylindrical, and tapering at both ends, from six to twelve inches long, and from two to three lines thick. The body is of a whitish or yellowish color, and almost transparent, firm and elastic. The head is separated from the body by a circular depression, and has three small elevations, between which lie the teeth. The male is smaller than the female, and curved at the tail end, where the sexual organs are placed. The female is about one-third larger and is straighter and thicker at the tail-end, and has the sexual opening near the end of the upper third. It has been estimated that a female *ascaris lumbricoidis* contains sixty-four million eggs.

The round worm inhabits the small intestine, but frequently passes into the large intestine, and out through the anus. It not infrequently migrates into the stomach, esophagus, and has also been known to find its way into the nares, Eustachian tube, frontal sinus, larynx, pancreatic and biliary ducts, and gall bladder.

The *oxyuris vermicularis*, or common seat worm, also known as the thread, fin, or maw worm. This worm varies in length from one to five lines, resembles in appearance and size a piece of fine sewing cotton, the female being about twice as large as the male. They are whitish, semi-transparent, their surface presenting fine transverse striæ.

"The head is furnished with three inconspicuous lips around a terminal mouth, and an elongated vesicular expansion on the dorsal and ventral aspects."

The male is rolled up posteriorly, where the sexual organs are placed. The female is but slightly bent, and its vulva is situated at about the junction of the anterior and middle thirds. This worm inhabits the large intestine, chiefly the rectum, rarely passing into the small intestine. They often crawl out of the anus and enter the vagina or urethra, or get under the prepuce. They occur chiefly in young children, but no age is exempt from their presence. They frequently exist in great numbers, hundreds and thousands lining the intestines, and sometimes passing off during stool in large masses or balls, agglomerated by mucus.

The *trichocephalus dispar*, the hair-headed or whip worm, is about an inch and a half or two inches long; the posterior part is quite thick, the anterior hair-like, ending in a simple terminal mouth.

In the male, which is the smaller, the posterior part is wound into a spiral and has at its end the hook-shaped penis, surrounded by a bell. The female is larger and thicker, and only slightly curved, and its posterior end contains an immense number of eggs. They inhabit the cecum especially, but are sometimes found in the colon, and, very rarely, in the small intestines. They do not occur in as great numbers as do the other varieties of nematodes already mentioned.

The *anchylostomum duodenalis* is a small cylindrical worm, five to eight lines in length, the female being twice as long as the male. The terminal mouth is surrounded by a thin capsular expansion, which is directed obliquely backward. The upper side is furnished with four small teeth, and the opposite side with four larger teeth. The vulva of the female is placed a little back of the center. This parasite inhabits the duodenum or jejunum, where it is present in very large numbers.

The nematodæ vary so in their individual characteristics and in the morbid phenomena which they produce that they will require separate consideration.

ASCARIS LUMBRICOIDIS.

Etiology.—The ascaris lumbricoidis is propagated by ova, and probably without the aid of an intermediate bearer, though this point is not yet established. The eggs being expelled with the feces, and often in countless numbers, gradually develop an embryo in damp earth or water. Both the eggs and the embryo seem indestructible, either by freezing or desiccation, and retain their propagating power for years. Davaine maintains that the ova, with their contained embryos, are swallowed with impure water, and develop directly into the adult form if received into the intestine of a suitable bearer. Others hold that this is not the case, but that it is far more probable that the ova are not transferred directly into the intestine of the ultimate bearer, but are taken up in some manner by an invertebrate intermediate bearer, possibly a worm, or the larva of an insect, thus passing through the necessary stages of metamorphosis, and then being discharged, are received into the stomach of the future host through the medium of food or drink. It is especially conceded that they are first introduced into the system through drinking water; thus it follows that in the country, and in other places where excreta easily gain access to water, and people are careless in their habits, the ova are rapidly disseminated through the water drunk. They may be propagated also in the same manner through certain foods, such as fruit, vegetables, salad, and other articles which are eaten in the raw state. It is necessary, however, that the ova or embryos find a congenial soil for their development. This condition results chiefly from uncleanness, and thus the ascaris thrives among the least cultivated nations, and, as a rule, among the lower class of people. Those who live in almost total disregard of sanitary requirements are especially liable to worms, their food being inferior in quality and poorly prepared, and their streets and surroundings being filthy and insalubrious. Continued indigestion, accompanied by irritation or inflammation of the mucous coat of the intestines, with excessive mucous secretion, especially in children, seems to predispose to the generation or development of worms. It has been frequently noted that children in the last stages of typhoid fever often pass lumbrici in the evacuations, but this may only be a coincidence.

Symptoms.—Probably in a majority of instances there are no symptoms of any kind present, it being nothing unusual to have lumbrici pass from the stomach or bowels of persons who had experienced no inconvenience or disorder of system whatever. Occurring in large numbers, and especially so in delicate persons, they may produce

a variety of phenomena, mostly indicating disorder of digestion, nutrition, or of the nervous system, with constant reflex manifestations. The most common symptoms are: itching of the nose, colic-like pains around the navel, boring and tearing pains in the abdomen, inflation of the region of the stomach, changeable appetite, and diarrhea, with the expulsion of masses of mucus, occasionally tinged with blood. There is often also some swelling of the face, darkening of the eyelids, unequal dilatation of the pupils, foul breath and general emaciation. Nervous symptoms, such as irregular pulse, unpleasant dreams, grinding the teeth during sleep, and starting out of it in a fright, are symptoms which, in children especially, are usually attributed to worms. These symptoms, however, have no diagnostic value, as they may be present with other varieties of worms, and even when no worms are present. Choreic conditions and epileptiform convulsions may result from worms and cease on their removal, and death has been known to result from convulsions so caused. Obstruction of the bowels, with its consequent phenomena, may result from a bundle of worms, either in the bowel or in a hernial protrusion, and when these worms migrate into other organs and passages, as they sometimes do, serious consequences may arise, the symptoms varying with the part visited. Especially do we find lumbrici in the larynx, producing symptoms of suffocation, and in the common duct, which they obstruct, causing jaundice, and ultimately serious derangements of the liver. Abscesses may also result from the local irritation.

Diagnosis.—The ordinary symptoms of worms are never sufficient for diagnostic purposes. Only when worms pass from time to time, or when a microscopical examination of the feces has revealed the presence of ova, can we determine positively that the symptoms result from their presence in the system.

Treatment.—At the present day, since the theory of the spontaneous generation of intestinal parasites has been exploded, and it has been demonstrated beyond question that they are propagated by means of ova being received into the system through the channels of food and drink, it is unwise longer to advocate the principles of treatment as set forth by Hahnemann and his immediate followers. These were established upon the then-prevalent theory that the worms were generated by morbid conditions of the intestine, resulting from a depraved systemic state, and were entirely in accordance with that doctrine. Hahnemann held that intestinal worms could only be successfully treated by removing by the indicated homœopathic remedy that morbid condition of the system which caused their generation, and that worms could not exist in a previously healthy intestine. It now appears that

these morbid conditions of system are the result rather than the cause, and while many of the symptoms so arising may be mitigated, or, perhaps, entirely removed by the aid of the indicated remedy, which may not be a vermicide, it also follows that to render a cure complete it is necessary first to administer an agent which will destroy the worm, and afterward to treat the remaining morbid conditions by the use of the indicated remedy. It must be admitted that intestinal worms thrive best in persons of unclean habits, and in those who are troubled with indigestion and intestinal derangements. It therefore follows that the preventive measures to be adopted are cleanliness, regularity in habits, the use of properly prepared foods, and more especially, the use of pure drinking water, carefully avoiding water from shallow wells, near residences, barns, or privies, or water obtained from small streams. It is most desirable to use only well filtered water. The diet should be plain, easily digested, and regular, no food being taken between the usual meals. Cakes, pastry, and sweetmeats must be forbidden. *Salt* as a condiment should be freely used.

Santonine, the active principle of *Cina*, or *Artemesia contra*, is our most efficient vermicide. It is usually given in the evening, and in doses of from two to four grains in powder in the form of troches, followed in the morning by castor oil or some other laxative. In children, from one quarter to a half grain is the usual dose. I have found this plan unnecessary, giving only the first or second decimal trituration four times a day for three or four days. In this manner, while usually destroying the worms, we fail to obtain the objectionable symptoms of disturbed vision, red urine, etc., which so frequently follow the administration of large doses of *Santonine*. If the worms are numerous, it is often necessary to persist in the treatment for some length of time.

Spigelia is also an excellent vermicide, and may be given in doses of one or two drachms of the fluid extract. It is mostly used in an officinal preparation, combined with senna.

Cina is more often indicated in the treatment of vermicular affections than any other remedy; it is often homœopathic to the existing morbid condition, and at the same time acts as a vermicide. The special indications for its use, and for the use of other remedies which control the conditions arising from the presence of worms, will be given at the close of this article.

Naphthalin is often very efficient. It should be given in from three- to fifteen-grain doses, three times a day.

Chenopodium is often effective. Two or three drops of the oil three times a day, for two or three days, followed by a dose of castor oil, is the usual method of its employment.

OXYURIS VERMICULARIS.

It is generally considered that the oxyuris vermicularis spends its whole existence, from the egg to maturity, in the intestinal tract of the same individual, which theory receives the support of Kückenmeister, Vix, Zenker, Heller and many others. Ransom, however, considers that this view is out of accord with the general law of development in parasitic animals, and does not suffice to explain the known facts. Leuckart insists that "the emigration of the embryo is a necessary condition of its future development, and has indeed almost proved the correctness of this view." He claims that "the ova deposited with the feces are abundantly and widely scattered in the dry state by winds and other agencies, and then are taken into our stomachs upon uncooked fruits and vegetables, and in various other conceivable modes; there, exposed to the digestive fluids, the embryo escapes, is carried down into the colon, and attains the adult form probably in about two weeks. A sort of self-infection may take place also; in persons already infested, it is easy to see how the ova upon the skin and hairs near the anus may be conveyed to the mouth by the fingers, after scratching to allay the violent irritation which these small pests produce; there are various modes in which the eggs may find their way into the stomach from the soiled bed-clothes or personal linen. These views explain some long-known facts which are not otherwise easily understood; for instance, the great length of time for which some persons suffer from seat worms, and the liability to relapse in spite of repeated treatment, the frequency with which these worms are found inhabiting many members of one family or household, the greater liability of children, of dirty or insane people, and of persons who often eat uncooked fruits and vegetables, as well as the immunity of infants at the breast."

Symptoms.—Only when the worms are located in the rectum do they give rise to inconvenience. Here they cause pain, tenesmus, and especially a violent itching and tickling in the anus and its neighborhood, which is intolerable, and occurs in paroxysms, mostly at night. Excitation of the sexual organs is apt to occur with seminal emissions, and it is stated that the habit of masturbation in either sex may originate from this source. In females, the worms frequently wander into the vagina, and by their excessive irritation cause pruritus and leucorrhea.

Diagnosis.—The diagnosis is easily made. Inspection of the fresh stools will usually reveal worms in active motion, and they may frequently be seen about the anus. If this is not the case, a small injection of cold water will cause those in the rectum to be ex-

pelled. A microscopic examination will reveal the ova—a certain diagnostic mark.

Treatment.—From what has already been said concerning the development and habits of this parasite, it is evident that scrupulous cleanliness is one of the most important prophylactic measures. Close personal contact, especially occupying the same bed, with infested persons should be avoided. Only pure water should be drunk, and the food should be well cooked.

In addition to the indicated remedy required for the correction of the general health, and the mitigation of the annoying symptoms usually associated with the presence of thread worms, it is quite essential to destroy and remove the parasites. This is usually accomplished by the use of injections. Sometimes only cold water is required, though salt and water is more efficient. Sweet oil, lime-water, quassia, or turpentine and castor oil, decoctions of onions or garlic, are sometimes employed in the enema. The folds and crevices about the anus and perineum and external genitals should be thoroughly sponged out with a one-per-cent solution of carbolic acid, and afterward anointed with lard or carbolated oil or vaseline.

Often it is found that destroying the worms only affords temporary relief. This is due to the fact that the *Oxyuris* breeds in the cecum, and that it is only the mature worm that descends into the rectum.

TRICHOCEPHALUS DISPAR.

Etiology.—This worm is propagated by ova, without the intervention of any intermediate host. The eggs, being expelled with the feces, are after a time developed into an embryo. In damp earth or water, and in warm weather, this development takes place much more rapidly than in cold or dry weather. The ova or embryos or both find their way into the stomach in some manner, probably upon raw food, especially fruits and vegetables, and become sexually mature in from four to five weeks, when they propagate with remarkable rapidity, it being estimated that the female uterus contains 58,000 eggs, and that the annual production is about 400,000. The farther and special etiology of this worm has not been established.

Diagnosis.—The *trichocephalus dispar* offers no symptoms that are at all reliable, and a diagnosis is only established by finding the worm in the feces, or by examining the feces microscopically, for the characteristic ova.

No treatment has as yet proved available to dislodge them, but it is a satisfaction to know that they are probably short-lived, and that

their further development may be avoided by proper hygienic measures, especially by the exclusive use of well-cooked food and pure water.

ANCHYLOSTOMUM DUODENALE.

Nothing is positively known in regard to the manner of propagation of this parasite; but it is supposed to be swallowed in embryo, with dirty, slimy water. It occurs only in tropical countries, and as far north as Italy. It affords no special symptoms, but is supposed on account of its blood-sucking qualities, to be the cause of a very fatal disease, known as tropical chlorosis, or Egyptian chlorosis, a peculiar anemic condition which is said to follow intestinal hemorrhage due to this parasite. Griesinger recommends turpentine as the remedy. Male fern, santonine and thymol are also recommended. A preparation, called *doliarina*, is much used in Brazil, and is composed of the juice of the *ficus doliarina*, iron and aromatics. (Flint.)

TRICHINA SPIRALIS.

Description.—When expelled from the cyst in its mature state, the male is about one eighteenth of an inch long, and the female twice this length. They have the appearance of an extremely fine, round, thread-like, slightly coiled worm. So long as they remain in the muscular tissue, they are sexually immature, and are in a quiescent state. The sexual system is fully developed in the intestinal canal of its host, and in the female consists of an ovary, a uterus, and a vagina. It is viviparous, and discharges from the vaginal outlet about one hundred embryos a week, and the birth of the embryos begins in about a week after the female enters the intestine. As more females than males are borne, and as the successive formation of embryos from the eggs may take place, the number developed becomes enormous. The viable embryos are in lively motion, and at once begin a process of migration, finding their way through the blood (Heller) or the intestinal walls and connective tissue, which is the route generally accepted by investigators, until they reach the muscles, where they force themselves into the primitive fasciculi, coil into a spiral form, and become surrounded by a calcareous cyst, which has an ovoid shape, and is visible to the naked eye, as a whitish or gray speck. As intestinal trichinæ, the parasites rarely live longer than from five to eight weeks, but as muscle trichinæ, their vitality is almost unlimited, and frequently ends only after the death of the persons affected. Cases are reported showing conclusively, that patients have been affected many years. It is equally certain, that the flesh of animals, which have been affected with the

parasite, ever afterward may contain living trichinæ, and could not be eaten with safety. The flesh of a single trichinous animal may produce trichinosis in a large number of persons, and thus the disease resembles an epidemic in its prevalence. Man, the hog, and the rat seem to be the principal host of the trichina, but it has been found in the cat and other animals, as the rabbit, guinea pig, and dog, though in the latter, never developing farther than the intestinal form. It is found wherever man and swine exist, being especially prevalent in those sections where pork is largely used as an article of diet.

Symptoms.—Some authors attempt to divide the symptoms of trichinosis into two or three stages, corresponding to the stage of intestinal development, migration, and encapsulation of the parasite. This, however, can not be done with any degree of certainty, as the symptoms are not uniform in their appearance and duration. Symptoms of gastro-enteric irritation first make their appearance. The patient experiences a general feeling of discomfort and fullness in the epigastrium, the appetite is impaired, emaciation and nausea appear, and then vomiting occurs, which may end with the first ejection of the contents of the stomach, or may last with much retching and anguish for several days. The mouth feels pasty, and the patient complains of a loathsome, putrid odor being continually present. There is almost always diarrhea, the passages being at first brownish, subsequently yellow, thin, and accompanied by more or less severe colicky pains. The diarrhea usually lasts for some time, may indeed continue for weeks, and greatly exhaust the patient, but the other symptoms generally disappear in about one week, giving place to those which are dependent upon the condition of the muscles. Occasionally there is an absence of intestinal symptoms in the first stage, and the patient only experiences a feeling of lassitude and depression, with wandering pains and stiffness of the limbs. This stage is supposed to correspond to the introduction of the trichinæ into the intestinal canal and the commencement of their migration toward the muscles. Flint remarks that it is not difficult to understand that the aggregated puncture of the mucous membrane by these parasites should occasion notable disturbance, when it is considered that the trichinæ which have been found to be contained in a half pound of meat may be sufficient to give birth in a few days to a brood numbering thirty millions. Before the primary symptoms disappear, fever supervenes, which is probably coincident with the birth of the embryos and the beginning of migration. The fever is remittent in its character, with morning remissions, and usually is quite similar to that of an ordinary case of typhoid. The temperature runs from 101° to 106° , and the pulse from 90 to 140, and is usually small and weak.

There is an abundant clammy perspiration, which is not critical and does not relieve the fever; intense thirst, dry tongue and lips, red swollen face and occasionally sudamina appear. During the existence of the fever, and sometimes before its onset, the muscles of the body appear flabby and are sore to the touch, but Heller remarks that this state must not be confounded with that condition of the muscles caused by the entrance of the parasites into them.

The symptoms of invasion of the muscular system supervene about the tenth day, and vary in severity with the number of parasites entering the muscles, sometimes only amounting to a soreness, but most often the muscles are hard, swollen and very tender. The muscles of the extremities are most affected; those of the trunk to a less extent. The pains are of a rheumatic character, and may be very violent. There is great rigidity of the muscles in the neck, back, arms, and legs, movement being greatly impaired, and the joints in a fixed state of more or less flexion, any attempt to extend them causing great distress. From implication of various muscles there may result attacks of severe dyspnea, aphonia, difficult mastication, dysphagia, partial deafness, impaired movement of the tongue, and double or distorted vision. Edema soon appears in the eyelids and face, which subsequently extends to the lower extremities, and sometimes anasarca occurs. Edema of the larynx is not uncommon. The patients are usually sleepless, though their mind is ordinarily in a state of apathy and indifference. In children, however, sleeplessness is not present, a somnolent condition characterizing the attack throughout. In cases tending toward a fatal issue, low typhoid symptoms set in, and frequently, about the end of the fourth week, bronchitis, pleurisy or pneumonia may arise to complicate the case. The course of the disease may vary from a few hours to several weeks, according to the number of parasites introduced. Very light cases recover in about three weeks, often not having been confined to the bed, but in more severe cases, even though of comparatively mild type, convalescence does not begin until the fifth or sixth week, while in fatal cases this is the time of the greatest mortality. Should recovery ensue, as it may even in severe cases, from encapsulation and the consequent quiescence of the parasites, the muscular symptoms subside, the fever abates, but more or less edema and anemia remain, and the exhausted patients gain strength very slowly, often three or four months elapsing before entire recovery has taken place. In fatal cases death may occur from pneumonic complications, from impairment of the respiratory muscles, from the presence of the parasites in them, or from the pro-

longed suffering and exhaustion. According to Heller, cases of death after the seventh week are rare.

Diagnosis.—The diagnosis is often difficult in isolated cases, but a diarrhea, soon followed by the characteristic muscular pains, lameness and edema is sufficient to excite suspicions of trichinosis, and lead to investigation, and, if possible, to microscopic examination of the meat eaten. The worms may be discovered in the stools. The stools should be spread on a glass plate or black background, and examined with a low-power lens, when the trichinæ are seen as small, glistening, silvery threads. If there is still doubt, a small piece of affected muscle may be excised and examined microscopically. Ordinarily, the muscular symptoms are sufficient to distinguish trichinosis from cholera, typhoid fever, and other affections for which it might be mistaken. From rheumatism it may be distinguished by the gastro-intestinal symptoms, and by the profuse perspiration, apathy, and great exhaustion. After migration has taken place, the symptoms are so characteristic that the diagnosis can scarcely remain in doubt.

Prognosis.—The prognosis is always a matter of doubt, and can not be positively made. The issue depends upon many direct circumstances, but especially upon the number of trichinæ introduced, which may be fairly conjectured by the number in the meat used, and the comparative rawness of the flesh when eaten. Those cases commencing soon after eating, and those ushered in violently, are usually the most severe. Marked early diarrhea is favorable. Even the severest cases, however, may recover by encapsulation of the parasites. Cases in children seldom prove fatal. The mortality ranges from five to forty per cent.

Treatment.—The results of treatment thus far have proved quite unsatisfactory. In fact, it is doubtful if there is any remedy, at least after the parasite has migrated to the muscles.

For the destruction of the trichinæ in the intestinal canal, carbolic acid has been used with apparent success; so, also, has glycerine, which seems to cause a shriveling and death of the parasite. After the parasite has migrated from the intestine, we can only rely on the indicated homœopathic remedy to control the symptoms that may arise. Hot baths, friction, with salt and massage, are said to be important auxiliary measures. The patient should be sustained by the use of milk, beef-tea, egg-nogg, etc.

The only preventive measure is to abstain from the use of all pork, ham, or sausage that is not thoroughly cooked.

THERAPEUTICS OF INTESTINAL PARASITES.

In addition to the methods suggested for the destruction and removal of intestinal worms, our *Materia Medica* affords a number of remedies which have been proved valuable for the relief of symptoms associated with the presence of these parasites or which remain after their removal.

Cina (3x) is our most important remedy. It not only covers the range of symptoms most often found in connection with the presence of round or thread worms, but containing *santonine* as its active principle, it is practically a vermicide, and frequently the only remedy required for the removal of the parasites and the symptoms they may have produced. Its chief indications are: child irritable and cross; has dark rings around the eyes, and a sickly expression; white and bluish around the mouth; tossing about in sleep, with sudden cries; boring in the nose with the fingers; grinding the teeth at night; great hunger or loathing of food; nausea and vomiting; abdomen hard and distended; twisting, colicky pains; itching of the anus; turbid urine; dry, hacking cough which causes gagging; twitching of the muscles, and convulsive motion of the head and limbs; fever usually intermittent or remittent in its character.

Ignatia (3x).—Especially in mild, nervous children. Itching and crawling at the anus and in rectum, as from thread worms; *prolapsus ani*; epileptiform convulsions.

Merc. sol. (3x).—Excessive hunger; salivation; fetid odor from the mouth; abdomen hard, distended and painful; glandular swellings; will sometimes cause discharge of *ascarides* or of *lumbrici* without other aid.

Aconite (3x).—Worm-fever: Excessive restlessness, face red and pale alternately; loathing of food; intolerable nightly tingling and itching at the anus as from thread worms.

Spigelia (3x).—Nausea every morning, better after eating; *strabismus*; pale face, blue rings around the eyes; faint; nauseated; colic; sensation of a worm rising in the throat, better after eating; itching and tingling in anus and rectum. It is claimed that inhalations of the tincture will arrest convulsions from worms.

Sulphur (6x).—Especially after other remedies have failed; excessive, ravenous hunger, though the stomach feels full and distended after eating but little; nausea before meals, and gone, faint feeling about 11 A. M.; abdomen distended; itching and crawling in rectum and anus; turbid urine; emaciation and debility.

Stannum (6x).—Hahnemann claimed that *stannum* would so

stupefy the worms that they could be dislodged by purgatives. The child wishes to lie on the stomach; torpid and sluggish disposition; bad breath; pale, sunken face and eyes, the latter surrounded by blue rings.

Teucrium (Tincture or 1x).—*Ascarides* or pin worms; much irritation in the rectum.

Calcareo carb. (6x)—In leuco-phlegmatic children, especially when there seems to be a hereditary predisposition to worms, to eradicate the tendency; abdomen hard and much distended; children of a scrofulous habit. Consult also *Terebinthina* (3x), *Cinchona* (3x), *Ferrum* (6x), *Sabadilla* (1x), *Urtica urens* (1x), *Antim. crud.* (6x).

VII. DISEASES OF THE LIVER.

JAUNDICE.

Synonym.—Icterus.

Definition.—Jaundice is not a disease, but a symptom, arising in consequence of hepatic derangement, and consists of a yellow discoloration of the skin and other tissues, and the secretions, due to an admixture of the bile pigments.

Etiology.—Two varieties of jaundice have heretofore been described, the obstructive and non-obstructive, or the *hepatogenous* and the *hematogenous*. Recent investigations throw grave doubt upon the existence of jaundice except as occurring from obstruction either in the larger or smaller ducts. I shall, therefore, only describe the obstructive variety. Murchison gives the following classification of the causes of obstructive jaundice: "Obstruction (1) by foreign bodies within the ducts, as gall stones and parasites; (2) by inflammatory tumefaction of the duodenum or of the lining membrane of the duct; (3) by stricture or obliteration of the duct; (4) by tumors closing the orifice of the duct or growing in its interior; (5) by pressure on the duct from without, as by tumors of the liver itself, of the stomach, pancreas, kidney, or omentum; by pressure of enlarged glands in the fissure of the liver, and more rarely, of abdominal aneurysm, fecal accumulation, or the pregnant uterus; (6) to these may be added lowering of the blood pressure in the liver, so that the tension in the smaller bile ducts is greater than in the blood vessels. In this class very probably may be placed the cases resulting from mental shock or depressing emotions." Of all the causes here named the second is by far the most frequent, giving rise to the most common form of jaundice,—catarrhal,—and which alone will be here considered. Jaundice as arising from other causes named will be referred to when considering the symptoms

and pathology of those conditions. It might be well, however, to remark that in addition to the causes already named, jaundice, other than purely catarrhal, may, according to Anders, be caused by "(a) certain fevers, as yellow-fever, relapsing fever; (b) grave forms of anemia, as pernicious anemia and chlorosis; (c) certain poisons, as in pyemia, septicemia, shock, snake-bite, chloroform and ether poisoning; also in poisoning by phosphorus, arsenic, mercury and other minerals."

CATARRHAL JAUNDICE.

Synonyms.—Hepatogenous Jaundice, Icterus Catarrhalis, Inflammation of the Common Bile Duct.

Definition.—A yellow discoloration of the tissues, due to the retention and absorption of bile, resulting from an acute catarrhal inflammation of the mucous lining of the bile ducts, and of the duodenum.

Pathology.—The mucous membrane of one or more of the bile ducts, more especially the common duct, or of the duodenum, or both, becomes inflamed, swollen and thickened, causing a closure of the bile ducts, and consequent obstruction to the onward flow of bile. The gall bladder and ducts become distended with bile, which is absorbed into the blood by the lymphatics and veins.

Simple catarrhal jaundice may result from such causes as would tend to produce catarrhal conditions in other localities, more especially gastro-duodenal catarrh, which usually precedes this condition. These are: exposure to cold and wet; improper food; irregular and hasty eating; alcoholic and other stimulants, including the prolonged, or excessive use of tea or coffee; overwork, physical or mental. It may also follow or accompany certain diseases, such as typhoid or malarial fevers, or pneumonia, and may result from portal obstruction, especially when occurring in chronic disease of the heart or kidneys. In rare instances catarrhal jaundice occurs epidemically.

Symptoms.—The discoloration of the tissues and secretions by bile pigments constitutes jaundice, and may exist, in rare cases, without other symptoms. Any or all the tissues, except mucous membrane, may become icteric. The skin shows the discoloration most plainly, the conjunctivæ are usually affected first. All the secretions may also show the yellow discoloration, but the urine shows it first, and most pronounced. The color may range from a light yellow to a dark green, almost black. The shaken specimen foams, and the froth has a yellow color-tint. Often the presence of bile is detected before any noticeable coloring of the conjunctivæ occurs. Hyaline tube-casts are not uncom-

mon, and in severe or protracted cases, there may be a moderate amount of albumin in the urine. The best reagent is nitric acid, which is not altogether free from nitrous acid. By adding the concentrated acid, drop by drop, into a small glass containing urine, the well-known play of colors, from brown to green, blue, violet and red, will be seen arranged in layers, one above another, like a rainbow. The *sweat*, especially of the axilla, colors the white linen yellow, and so also have the sputa in bilious pneumonia a brown, or usually, a leek-green color. According to the extent of the icterus, do we find the opposite condition in the stools; the feces having been deprived of their normal coloring-matter. They may only show a lessened normal color, or become slate-colored, gray or even almost white. Constipation is the rule, though in some cases, diarrhea occurs, and the stools are usually offensive.

Jaundice is usually preceded by symptoms of gastric catarrh—malaise, loss of appetite, coated tongue, eructations, nausea, vomiting, and often epigastric pain and tenderness. These occasionally being ushered in with a severe chill and violent headache. In from three to five days the jaundice appears. The digestive functions become more disturbed, the tongue is more heavily coated, there is a bitter taste in the mouth, and generally considerable flatulence in the bowels. The temperature is often subnormal, though in some acute cases of what is termed febrile jaundice, it may go up to 100° F., or even 102° F., but no higher, except at the end of "pernicious" cases as will be explained later on. The pulse retains its normal force and volume, but is usually very slow, in severe cases falling as low as twenty or thirty beats per minute, though this is not considered an unfavorable symptom. Pruritus of the skin is severe and distressing, especially in protracted cases. In severe cases purpuric spots and ecchymoses appear beneath the skin and mucous membranes, and sometimes profuse hemorrhages occur, especially from the nose, stomach and intestines. In all cases there is more or less headache, vertigo, irritability of temper and inability to concentrate the mind. In very severe cases the cerebral symptoms greatly simulate those of uremia and no doubt renal complications are often present. In such cases there is delirium, stupor and coma, and possibly convulsions. In some instances a typhoid state with hemorrhages sets in. The temperature may fall below 90° F., but more often a high ante-mortem temperature, from 106° to 108° F., is observed. These cases are sometimes termed "pernicious jaundice," also "acholia," "cholemia" or "cholesteremia." These cases occur in connection with cirrhosis, acute yellow atrophy and other organic diseases of the liver, but have also occurred and proved fatal when no organic

liver lesion could be recognized. The true nature of the toxic agent that acts so destructively, is unknown, but Frerichs ascribes the toxemia to the pernicious influence of unknown substances which, under normal conditions, should be elaborated by the liver into bile.

Diagnosis.—It is quite easy to diagnose jaundice, but not always easy to establish the nature of the obstruction. Generally, however, with symptoms above described, and the absence of symptoms indicating organic diseases of the liver, such as acute yellow atrophy, cirrhosis, and carcinoma, it may be fairly safe to consider the case due to catarrh of the ducts.

Prognosis.—In a vast majority of cases the prognosis is favorable, but owing to the fact that severe and fatal cases do sometimes occur when least expected, the prognosis, except in evidently mild cases, should always be guarded. According to Pepper, a rise of temperature means mischief, and the occurrence of hemorrhages always render the case doubtful. Ordinarily the duration of catarrhal jaundice is from two to six weeks. If the jaundice remains longer than six or eight weeks, it is very likely that the obstruction is other than catarrhal.

Treatment.—*Hygiene* and *diet* are of first importance. Unless the constitutional symptoms are too severe to admit of it, the patient should be encouraged to take moderate exercise in the open air every day, and a daily thorough bath followed by brisk rubbing with a rough towel should not be omitted. The diet should be chiefly of milk, which may be diluted one half with a carbonized table water. Some only use skimmed milk or buttermilk. No rich foods, fats, pastries, or sweets should be allowed. Indeed it were better to restrict the patient to milk entirely, but plain food, especially light soups, containing no fat; fresh vegetables and sour fruits may be allowed in moderation. Sour lemonade is the best drink. Sour wines may be allowed. Pure water should be drunk freely.

The bowels should be kept open by means of enemata of water or glycerine, or if these fail, by giving olive oil, a tablespoonful every four hours. If this fail, the natural saline waters should be used. Flushing the colon daily with cold water is often of benefit. It increases the peristalsis of the intestines and the reflex contractions of the gall bladder dislodge the mucus obstructing the gall ducts. At first the temperature of the water should be 60° F., but in later injections the temperature of the water may be reduced gradually, so that finally ice-water may be used. Pruritus is to be treated by bathing the itching parts with a solution of carbolic acid or one of bichloride of mercury or a satu-

rated solution of sodium bicarbonate may be used. Washing out the stomach daily is of special advantage where symptoms of gastric catarrh are predominant. Gatchell recommends Naphthalin in two-grain capsules to be placed in the rectum as a disinfectant.

Therapeutics.—My own experience is that *Podophyllum* and *Mercurius* are the most useful remedies. Of the mercurial preparations I prefer *Merc. dulc.* The remedies next in order are *Cinchona*, *Nux vom.*, *Myrica*, *Phos.*, *Hydras.*, *Chel.*, *Dig.* Hale recommends *Gels.* as capable of arresting the catarrhal inflammation at its onset. He also recommends giving one or two grains of ox-gall with each meal, and also as an intestinal antiseptic to overcome the putridity due to an absence of bile in the intestine. He advises salol in doses of three grains every six hours. I have never derived any benefit whatever from the higher potencies in the treatment of jaundice. I have learned from experience that it is better to give the low dilutions even to the point of producing physiological effects. The following are the chief indications for the most important remedies.

Podophyllum (2x).—This drug produces a true catarrhal duodenitis, followed by jaundice, and the cases reported from it are innumerable. (Hale.) It seems also to be especially useful when gall stones are present. Fullness with pain and soreness in right hypochondrium; tongue coated white or yellow; bitter, sour taste; constipation or alternate diarrhea and constipation; stools clay-colored; urine scanty and dark yellow.

Mercurius (3x).—This is one of our most frequently indicated remedies, not only in catarrhal but also in all other forms of jaundice, but it is especially useful in duodenal catarrh with extension of the inflammation to the bile ducts. Thickly coated, flabby tongue showing the imprints of the teeth; breath fetid; region of liver sore and painful, worse when lying on the right side; diarrhea; stools whitish-gray, exco-riating; tenesmus. Very useful in the jaundice of newborn children. As a rule *Merc. dulc.* 2x is the most effective preparation.

Cinchona (2x).—Jaundice following gastro-duodenal catarrh, or loss of vital fluids, or after severe and protracted illness, especially after malarial fever, also from gall stones. Dullness and confusion of the head; headache as if the head would burst; tongue coated yellow or a dirty white; nausea with canine hunger, or loss of appetite; longing for acids; bitter or sour eructations and taste, soreness over the liver; great flatulence; diarrhea; clay colored stools; great prostration.

Nux. vom. (3x).—This is the chief remedy where the symptoms of gastric catarrh predominate. Headache, dizziness, loss of appetite, bitter taste; nausea, vomiting, gagging; pressure in the stomach, better

from belching, soreness of the pit, stomach and bowels; unsuccessful urging to stool, constipation. Itching of the skin in the evening; restless sleep; wakes about three or four o'clock in the morning and falls again into a heavy, unrefreshing morning sleep; peevish, irritable.

Myrica (1x).—The chief action of this drug is upon the liver, where it causes a suspension of the biliary secretions, resulting in jaundice and its usual consequent phenomena. Yellow color of the face and conjunctiva; thick, yellow coating on the tongue; taste foul, bitter, nauseous; pain in region of liver; mushy, clay-colored stools; frothy urine; itching of the skin.

Phosphorus (3x).—Jaundice from anemia; from brain disease; during pregnancy. "Malignant" cases. From organic changes in the liver. Sensitiveness in hepatic region, worse when lying on right side; gray or whitish gray stools; constipation or debilitating diarrhea; mental dullness; typhoid symptoms.

Hydrastis (1x).—"Hydrastis is invaluable when the gastric and duodenal mucous membrane exudes large quantities of whitish-yellow mucus, with much vomiting. Our provings do not show any jaundice from hydrastis because they were not carried far enough." (Hale).

Soreness and pain in region of liver; yellow skin; light-colored stools; constipation.

Chelidonium (2x).—This is a valuable remedy in jaundice and has proved palliative in the passage of gall stones. Goodno gives this remedy "in a routine manner when another remedy is not clearly indicated." The symptoms are well defined—soreness, swelling and pain in right hypochondrium; tongue coated yellow with red margin, showing imprint of teeth; or coated white; diarrhea, stools yellow or clay-colored; skin and whites of the eyes yellow. These symptoms may be more or less present, but there is another symptom that is still more characteristic and is always present when Chelidonium is well indicated—a pain under the angle of the right shoulder blade, which may extend to the chest, stomach or hypochondrium.

Digitalis (1x).—Probably this drug deserves a higher place than the last on the list of important remedies. It is especially useful when the heart muscle is weakened or other cardiac changes result from the icterus. Also often when associated with an enlarged and indurated liver; soreness over the liver, slow, or irregular pulse; urine scanty and high-colored; ashy white stools. According to the older ideas of the pathology of jaundice, digitalis was not supposed to be "useful in jaundice from retention of bile by obstruction, but when the liver fails to remove the coloring matter of bile from the blood."

Crotalus (6x) and **Lachesis** (6.).—Must not be forgotten where

pseudo-jaundice, usually called hematogenous, is present, due to low states of the system or septic conditions such as are present in yellow fever and other pernicious diseases.

BILIARY CALCULI

Synonyms.—Gall stones, Cholelithiasis.

Definition.—Concretions originating in the gall bladder, consisting entirely or in part of bile constituents, principally cholesterine.

Description.—Gall stones may occur singly, in which case they may attain a very large size, or they may be present in almost any number even into the hundreds and thousands, the size being in an opposite ratio to the number. When numerous, they are very small, varying in size from a grain of sand (gall gravel) to a small pea. Some three years ago I had a patient who, under the olive-oil treatment, passed five hundred and sixty calculi in forty-eight hours. The first were as large as a pea, growing gradually smaller until they were scarcely more than gravel. A considerable amount of the latter passed after the counting had ceased. Single stones are rare. Generally from four to eight are found together. The color varies from white to a waxy lemon or a greenish-yellow, according to the amount of pigment they contain. More rarely they are bronze-green or even black. The purer cholesterine-calculi are nearly white, are of a crystallized structure, and readily cut like wax. The calculi are round, irregular, or oblong, or they may be polyhedral and faceted by mutual pressure and friction. When a large number are found in one bladder, they are alike in shape, color and chemical composition, but frequently vary in size.

Biliary calculi are not always composed of the same ingredients. Some are composed of cholesterine exclusively, or mixed with bile-pigment. Others, in addition, contain the salts of lime and magnesium. These two forms are most common. They are soft, light, and can be easily cut with a knife. In rare cases the calculi are found to consist solely of bile-pigment or of calcium carbonate. The latter are hard, and usually have a central nucleus, consisting ordinarily of mucus or bile-pigment.

Inspissated bile may form a brown or greenish-black semisolid mass, and while not constituting a true biliary calculi, it may give rise to the same symptoms.

Etiology.—Gall stones occur much oftener in women than men, probably from the fact that they lead a more sedentary life, and also perhaps from the effects of tight lacing and pregnancy. Gall stones rarely occur during childhood, and are most frequent in middle and

advanced life, the liability increasing with advancing years. Corpulent people and those leading sedentary lives, especially when both are combined, are more liable to biliary calculi. When with these we have also added high living, irregular habits, and excessive diet of starches and fats, the liability becomes much greater. Biliary calculi are sometimes hereditary. Constipation is regarded a cause, as are also depressing mental influences. Any cause retarding the flow of bile, and all unhealthy conditions of the bile ducts favor the formation of calculi.

Symptoms.—Gall stones, in large numbers, may remain in the gall bladder for an indefinite period without giving rise to appreciable symptoms, or the individual being aware of their presence. Nanyin states that post-mortem examinations show that they are present in twenty-five per cent of all women over sixty years of age.

Gall stones produce symptoms in three different ways: (1) By their passage through the ducts; (2) by their impaction in the ducts; (3) by their retention within the gall bladder.

1. *Passage through the Ducts.*—Small calculi may pass without causing definite symptoms, but when large enough to become impacted in the duct, they give rise to hepatic colic. This begins suddenly, the patient being seized with an agonizing, cutting, tearing or lancinating pain in the right hypochondrium or in the region of the gall bladder, and which spreads over the abdomen, right chest and shoulder; the abdominal muscles are cramped and tender; there is nausea and vomiting; profuse sweat; a small, feeble pulse; cool skin; pale, distorted, anxious face; with possibly fainting, spasmodic trembling, chills or even convulsions. There may be marked tenderness in the region of the liver, which may be enlarged, and the gall bladder may become palpable and very tender. The temperature is temporarily raised during the attack to 102° or 104° F., but if the attack be slight and of short duration, there may be no fever. The paroxysm continues from an hour or two to several days, with remissions, but entire relief is not afforded until the stone reaches the duodenum, when the pain suddenly ceases.

Jaundice usually, but not invariably, follows the paroxysm of pain. When the calculi reaches the intestines, the pain, nausea and vomiting cease, the appetite returns, and the jaundice soon disappears. Rupture of the duct, followed by fatal peritonitis, occurs occasionally. The distended gall bladder may often be palpated, and if a number of calculi are present, crepitation is felt, and a friction sound may sometimes be heard on auscultation.

Diagnosis.—The diagnosis can be assured by the character of the

symptoms, but is only positive when the calculi are found in the stools, or in the vomitus, as is sometimes the case. The presence of jaundice is diagnostic, and a history of previous attacks is confirmatory. When a stone presents a faceted appearance, it signifies that it is only one of several, possibly many.

Prognosis.—The prognosis as to the immediate attack is good, though fatal complications, such as syncope, collapse, intussusception, cardiac trouble, and cerebral hemorrhage, have occurred. The prognosis as to an absolute cure is doubtful, as it can never be certain that the patient may not sooner or later have more calculi form with the usual consequences.

2. *Impaction in the Ducts.*—This may occur and cause obstruction in either (a) the common duct, or (b) the cystic duct, the effects in each being different. In some instances, a calculus may pass into the common duct and remain there, without causing an actual obstruction.

a. **Obstruction of the Common Duct.**—This results in either (1) Catarrhal cholangitis, or (2) Suppurative cholangitis.

1. *Obstruction with Catarrhal Cholangitis.*—The biliary ducts are greatly dilated, and often contain thin, colorless mucus. The liver is enlarged and firm, showing an increase of connective tissue, and sometimes cirrhotic changes. The symptoms are jaundice, pain, and those of an intermittent fever. The extent of the jaundice depends upon the amount of obstruction, and may vary from time to time in an irregular manner. It may persist for months and years, and usually deepens, and becomes more constant after each paroxysm. The itching is often very intense and distressing. Pain is not a constant symptom, but is sometimes severe, and of a colicky character, and is often associated with nausea and vomiting. The fever is of a quotidian, tertian or quartan type, the paroxysms closely resembling those of malaria. Chills occur, with elevations in temperature, to 103° or 104° F., the fall of the fever being accompanied by sweating. These ague-like paroxysms may occur with regular periodicity, and may continue at intervals for months, or even for years. The prognosis is favorable. Even though the paroxysms recur for years, there is rarely any appreciable failure in the general health.

2. *Obstruction with Suppurative Cholangitis.*—When suppuration occurs, it may involve all the ducts, and also the gall bladder. It may also extend to the liver and produce abscesses, especially along the neighborhood of the ducts. Perforation of the gall bladder may occur, and abscesses form between the liver and stomach. The general symptoms are the same as in the catarrhal form, but more pronounced, and the paroxysms more frequent. The liver becomes enlarged and

tender, symptoms of septicemia, or of pyemia, develop, and the disease runs a short and fatal course.

b. Obstruction of the Cystic Duct.—There is usually no jaundice, the gall bladder being distended with a thin, colorless, mucoid fluid, constituting the so-called *hydrops vesicæ felleæ*, or dropsy of the gall bladder. This may be felt distinctly below the lower edge of the liver as a fluctuating tumor, ranging in size from that of a hen's egg to one of enormous dimensions, even occupying a greater part of the abdomen, and sometimes being mistaken for an ovarian tumor. The contents are either neutral or alkaline, and albumen is usually present. If catarrhal inflammation of the gall bladder be present, there is great sensitiveness to touch and often severe pain simulating hepatic colic. In rare cases acute phlegmonous cholecystitis may occur, with perforation and fatal peritonitis.

More often a suppurative cholecystitis, or empyema of the gall bladder occurs. In such instances the bladder usually contains calculi, and at the time is distended with pus, sometimes to an enormous degree. Septic symptoms are those of a localized abscess. Perforation may occur into the peritoneum, into hollow viscera, or through the abdominal wall, forming biliary fistulæ; or there may be formed an acute circumscribed peritoneal abscess. Calcification of the gall bladder or lime incrustations of the mucosa may follow the drainage of the empyema. Atrophy of the gall bladder may occur, the organ shrinking into a small mass of connective tissue, usually enveloping a stone.

A calculus becoming impacted in either the common or the cystic duct may by slow degrees pass along until it is emptied into the duodenum. Particularly is this the case if there are a number of stones wedged together, and the wedge becomes broken up so that the individual stones may readily pass. In other cases the calculus remains in the duct indefinitely, sometimes not producing complete obstruction or it may cause perforation, a biliary fistula being formed which may open through the abdominal wall into the abdominal cavity, into the duodenum or the colon, more rarely into the gall bladder, the substance of the liver, the lungs, the stomach, the small intestine or the pelvis of the kidney. The calculi may be discharged through the fistulous opening, frequently in great numbers, and spontaneous cure may result. Obstruction to the bowels may result from the perforation of large, solitary gall stones, into the duodenum. In other cases perforation of the duct leads to the formation of a circumscribed peritoneal abscess.

3. Retention of Calculi within the Gall Bladder. This occurs frequently, but often gives rise to no symptoms, though in many cases the stone enters the cystic duct from time to time, but drops back

into the gall bladder, this giving rise to a hepatic colic of mild degree and short duration. In other cases catarrhal or suppurative inflammation of the wall of the gall bladder is excited with the usual symptoms and consequences.

Treatment.—The treatment of biliary calculi may be subdivided as follows: 1. Preventive and solvent treatment. 2. Treatment of Hepatic Colic. 3. Treatment for removal of the Calculi.

1. *Preventive and Solvent Treatment.*—The essentials of prophylactic treatment are: A carefully regulated diet, abstinence from all fatty and saccharine foods, the use of fruits, green vegetables, and other foods that tend to promote laxity of the bowels, systematic daily exercise in the open air and the avoidance of all excesses—especially in the use of alcoholic liquors. Hot morning draughts of the alkaline mineral waters are of service, or sodium phosphate in drachm doses may be given in a tumblerful of hot water before breakfast.

I have very little confidence in the use of solvents, whether homœopathic or chemical. *Chelidonium*, *Calcarea carb.*, *Cinchona*, *Lycopodium*, *Podophyllum*, *Berberis* and other remedies have been recommended. As chemical solvents olive oil, ox-gall, sodium sulphate, sodium phosphate, sodium salicylate and sodium chlorate are recommended. I agree with Hale who prefers the sodium phosphate. I call to mind one case where the latter remedy apparently dissolved the stones, and the patient had no further trouble. Various alkaline mineral waters are recommended, those rich in sulphate of soda seeming to be most efficacious.

2. *Treatment of Hepatic Colic.*—The paroxysms of colic being due to mechanical causes, indicated remedies are of little service. *Nux vom.* given in a low dilution or mother tincture may facilitate the passage of the calculus. Hempel and Arndt say: “*Nux* will be found eminently useful in hepatic colic, a colic characterized by the sudden invasion of the most excruciating pain in the epigastrium and right hypochondrium, nausea and vomiting, spasmodic contractions of the abdominal muscles, coldness of the extremities, profuse cold perspiration.”

Chelidonium, *Berberis*, *Myrica*, *Hydrastis*, *Belladonna*, and other remedies have been recommended for the relief of biliary colic, but I do not consider that they are of any value whatever for the relief of the existing paroxysm. Olive oil, used freely, no doubt aids the expulsion of the calculi. Glycerine in large doses is also recommended. Hot baths and hot applications are of great importance. The latter may be in the form of fomentations, flax-seed poultices, hop bags or turpentine stupes. The continuous flow of hot water through rubber tubing, made

easy or application by recent devices, is probably the best form of administering heat in all cases of abdominal pain. Taking large draughts of hot water into the stomach often exerts a beneficial influence. In most cases it is both expedient and necessary to administer anodynes and anesthetics. Hypodermic injections of morphine ($\frac{1}{4}$ grain) with atropine ($\frac{1}{100}$ gr.) give best results. In severe cases a few whiffs of chloroform should be given, affording relief until the opiate takes effect. Codeine may be given internally in one-half grain doses. Hale has "seen good results from chloroform water, a teaspoonful every ten or fifteen minutes. One of my most intractable cases got more relief from chloroform water and phosphate of codeine, one tenth of a grain of the latter to each teaspoonful of the former, a teaspoonful every fifteen minutes. After three or four doses the pain always subsided. In a few cases I have injected hypodermatically one half of a grain of phosphate of codeine with good effect. It is useful, when, from idiosyncrasy, morphine is not well borne." Chlorodyne in fifteen-drop doses is often effective, and of late has been considerably used instead of morphine.

3. *Treatment for Removal of the Calculi.*—Many homœopathic remedies are recommended, but my experience in their use has been entirely unsatisfactory. *Nux vom.*, *Chel.*, *Cinchona*, *Myrica*, *Berberis*, *Podo.*, *Card. m.* and *Chionanthus* have all been used, and their virtues exploited. I have more confidence in *Chelidonium* (2x) than any other homœopathic remedy. It was Rademacher's great remedy for gall stones, and Buchner reports many cases where it did great service. Hale says, "I find no reports of immediate relief of hepatic colic from its use, but there is ample proof that it aids in the expulsion, and prevents their formation. I believe this is due to its peculiar action on the hepatic cells, causing them to secrete a thinner and more profuse bile. I have treated many intractable cases where the stones had remained in the duct several months,—in one case a year,—and where the icterus was intense, the whole body, eyes, tongue, lips, and vagina had assumed a greenish-yellow hue. Several of these cases did not improve until *Chelidonium* was given, and under its use the calculi were discharged." W. H. Dickinson reports a case cured with *Chelidonium*: "The patient, a woman, thirty years of age, had suffered for several years with repeated fits of hepatic colic. Under the continued use of *Chelidonium*, the attacks became less and less frequent, and finally ceased altogether." I have had a similar experience in two cases recently. I have the utmost confidence in olive oil. It has been used successfully in a large number of cases reported by physicians of great ability and reputation. I have used it in a number of cases with

most excellent results. Reference has already been made to one case where, under its use, 560 stones were passed within forty-eight hours. Hale says: "I first used it in 1866, in the case of a young woman who had been jaundiced for nearly three months, during which she had suffered from violent attacks of hepatic colic. Nearly every indicated remedy had been used without removing the impaction. I ordered at night a teacupful of oil. The next morning she passed several gall stones of the size of playing marbles. When broken, they presented a beautiful stellar crystallization. A prompt and permanent recovery followed. Since that time I have prescribed it with varying results, often curing many cases of long standing, and as often failing in others. The cause of these failures can not be explained."

Osler and others claim that olive oil is useless, and that the masses passed under its use are not calculi but fatty concretions. In the face of the testimony of very many well-qualified physicians who could scarcely be accused of making so unscientific a blunder, such claims and assertions are too absurd to merit consideration.

I always prescribe one-half teacupful of olive oil, morning and night, until the desired effect is produced. Glycerine promises much in the same line as olive oil, but I have had no experience in its use. Ferrand says: "If one desires to abort an attack of gall-stone colic, twenty to thirty grammes (five drachms to one ounce) will be found sufficient, and may be repeated for several days in succession, which, however, is seldom necessary. During the attacks it may be given every morning in doses of from one to three teaspoonfuls, in a half a glass of some alkaline water. Larger doses are best given in cherry laurel water, to which twenty-five to thirty grammes (six drachms to one ounce) of chloroform water are added, which latter exercises a sedative action on the gastric mucous membrane. To this any syrup may be added, and the mixture is given by the teaspoonful every hour, or it may be administered in larger portions. Even if given for a long time, glycerine does not have any injurious action; on the contrary, it prevents the usual constipation from the alkaline water." Anders recommends olive oil and glycerine combined, two tablespoonfuls of the former to one of the latter, three or four times a day. He also recommends the usual alkaline mineral waters and the use of cholagogues, considering as best, sodium phosphate, sodium chlorate, and ox-gall.

According to Osler the indications for surgical measures are: "(a) Repeated attacks of gall-stone colic, of great severity and danger. (b) The presence of a distended gall bladder, associated with attacks of pain or with fever. Many cases of obstruction of the cystic duct with

moderate distention of the gall bladder produce little or no inconvenience, and perfect recovery may take place with contraction and obliteration. (c) When a gall stone is permanently lodged in the common duct, and presents the group of symptoms above described."

The chief surgical measures employed are : (a) Cholédochotomy — removal from the common duct ; (b) Cholecystotomy — removal from the cystic duct ; (c) Cholecystenterostomy — making a fistulous opening between the gall bladder and the intestines ; (d) Cholecystectomy — extirpation of the gall bladder. According to Murphy the mortality in the latter operation is only seventeen per cent.

CONGESTION OF THE LIVER.

Synonym.—Hyperemia of the liver.

Definition.—An excess of blood in the liver. The congestion may be (1) *active* and (2) *passive*. In active hyperemia there is an excess of arterial blood, and in passive hyperemia, an excess of venous blood.

1. *Active Congestion.*

Etiology.—A normal temporary active congestion occurs after a hearty meal. Excesses in eating and rich foods produce an active congestion beyond physiological limits. Active congestion may also occur from sedentary habits, alcoholism, and in the course of infectious diseases, especially pernicious malaria, typhoid fever and dysentery.

Symptoms.—There are no characteristic symptoms. Often there is an associated gastric catarrh, with varied and manifold symptoms. Sometimes there is a slight enlargement of the liver, with tenderness on palpation, especially over the lower margin.

2. *Passive Congestion.*—This condition is also known as chronic congestion and nutmeg liver, and is of much more frequent occurrence than the active form.

Etiology.—Passive congestion occurs from any cause that produces a mechanical obstruction to the outflow of blood from the liver. This may result from valvular disease of the heart with a failing right ventricle; from diseases of the lungs, especially emphysema and cirrhosis, where the flow of blood from the right to the left heart is interfered with; from pressure on the efferent branches of the hepatic veins by intra-thoracic tumors.

Pathology.—"The liver is enlarged, firm, and of a deep-red color; the hepatic vessels are greatly engorged, particularly the central vein in each lobule and its adjacent capillaries. On section, the organ presents a peculiar mottled appearance, owing to the deeply congested

hepatic and the anemic portal territories, hence the term *nutmeg* which has been given to this condition. Gradually the distention of the central capillaries reaches such a grade that atrophy of the intervening liver cells is induced. Brown pigment is deposited about the centers of the lobules and the connective tissue is greatly increased. In this cyanotic induration or cardiac liver the organ is large in the early stage, but later it may become contracted. Occasionally in this form the connective tissue is increased about the lobules as well, but the process usually extends from the sublobular and central veins." (Osler.)

Symptoms.—Except in severe cases or those of long standing are there any marked symptoms that would indicate hepatic congestion. There may be a sense of fullness and weight in the region of the liver, causing discomfort, but rarely described as a pain, and which is worse from the pressure of the clothing and from lying on the right side. Other symptoms are chiefly those of the primary lesion. Gastro-intestinal symptoms, such as nausea, vomiting, coated tongue, and diarrhea or constipation, may be present. Mild jaundice may be evident in the conjunctivæ and in the urine. Hematemesis is not uncommon. Portal obstruction may be present, and ascites and anasarca develop. In severe cases of long standing the liver is enlarged, tender on pressure, and pulsates so that the impulse can easily be felt by placing one hand upon the ensiform cartilage, and the other upon the right side at the margin of the ribs.

Diagnosis.—Passive congestion is rarely diagnosed except where the causes which give rise to it are first made out, and then it becomes a comparatively easy matter. The *prognosis* depends entirely upon the cause, and our ability to remove it.

Treatment.—This is purely symptomatic. In active congestion *Bell.*, *Nux vom.*, and *Merc.* are oftenest needed. In passive congestion so much depends upon the nature of the cause, and the symptoms arising therefrom, that it is hardly possible to enumerate the remedies that might be indicated and useful. Dujardin Beaumetz says: "Of all the curative means employed, the most effective is the thermal treatment. Here we witness the triumph of Vichy and Carlsbad." Hale says: "Our schools in this country have reprehensibly neglected the great aid we can gain from the methodical use of similar waters which are found here. Nothing can be accomplished in these passive hyperemias, unless we reduce the diet of the patient to rational limits. All alcohol, sugar, new bread, high-seasoned soups and meats, except fish and lamb, must be given up. If this does not suffice, and the patient has not a dilated stomach, put him on a diet of Vichy and milk with

zwieback; a glass of half milk and half Vichy, with a slice or two of zwieback, every three hours. This will soon reduce the size of the liver, and lessen the engorgement. This diet will not distress the patient as much as he thinks, but he can not engage in hard physical labor he should, however, exercise in the open air. Euonymin 2x and Nux 2x are admirable remedies in such conditions." A strict milk diet, with an abundance of pure water, is most effective. *Podo.* (3x), *Chel.* (2x), *Cinchona* (2x), *Carduus* (1x), *Hydras.* (3x), *Lept.* (1x), *Iris* (1x), *Merc. sol.* (3x), and *Merc. dulc.* (2x) are all useful, and often indicated. When there is a primary lesion of the lungs or heart, the conditions and symptoms will call for a different class of remedies.

ACUTE PERIHEPATITIS.

Synonyms.—Subphrenic Abscess, Subphrenic Pyo-pneumothorax.

Definition.—An acute suppurative inflammation of the peritoneal covering of the liver and of the corresponding surface of the diaphragm.

Pathology.—The affected surfaces are congested, and covered with fibrin and pus. Fibrous bands form so as to mark off circumscribed areas, which are filled with pus, and constitute subphrenic abscesses. The pus may be yellowish-red in color, from the presence in it of bilirubin, and it may contain crystallized fatty acids. If the cause be a perforation of an ulcer of the stomach, or of the duodenum, the pus may be mixed with air constituting subphrenic pyo-pneumothorax.

Etiology.—Acute perihepatitis may result from direct violence, but is more often due to perforation of a gastric ulcer, or less often, to perforation of a duodenal or colonic ulcer. It may also result from infection or rupture of a neighboring abscess, especially of the liver, the gall bladder or right kidney.

Symptoms.—The symptoms are those of localized peritonitis. Severe localized pain in the hepatic region, great tenderness, high temperature and pulse, nausea and vomiting and rapid, embarrassed, painful respiration, owing to the involvement of the diaphragm. Very soon the symptoms of a peritoneal abscess or an abscess of the liver occur. The right hypochondrium becomes distended and motionless. Early in the disease a friction sound may be detected, but later this disappears, and is replaced by dullness and an absence of breath sounds and vocal resonance. The enlarged organ presses upward, and displaces the lung, over the latter a broncho-vesicular sound being heard.

Diagnosis.—Acute perihepatitis may be mistaken for empyema of the right side, but there is an absence of cough and especially of expectoration.

toration, and the heart is not displaced to the left. There is also a greater displacement downward of the liver. The aspirator is often necessary to a diagnosis. Placed between the seventh and eighth ribs, it should draw ochre-colored pus containing bilirubin and fatty acids.

Prognosis — This depends largely upon the nature of the primary disease, and our ability and timeliness in securing evacuation and drainage. If this is not done, rupture may occur into dangerous channels, or death may result from gradual asthenia.

Treatment.— This consists in absolute rest, the application of hot poultices, and the administration of the appropriate remedy from the standpoint of a suppurative process. *Belladonna* (2x) is usually the first remedy indicated, and later on we may require *Bryonia* (2x), *Merc. sol.* (3x), *Hepar Sulphur* (3x) or *Silicea* (6x) probably in the order named. When the diagnosis of an abscess is fully confirmed, surgical measures should not be delayed.

CHRONIC FIBRINOUS PERIHEPATITIS.

Definition.— A chronic inflammation of the perihepatic fibrous membrane.

Pathology.— The peritoneum covering the liver becomes opaque and thickened, and is adherent in spots to opposed surfaces. The fibrous capsule contracts, and this may result in atrophy of the liver, and occlusion of the veins and ducts. The pathology is very similar to that of "Glissonian Cirrhosis."

Etiology.— Chronic perihepatitis may follow the acute variety or be chronic from the start, resulting from protracted local pressure, as from a corset, from inflammation in contiguous tissues and from syphilis.

Symptoms.— There are no constant symptoms. Usually a dull pain in right hypochondrium. The *diagnosis* is always uncertain and problematical.

The *treatment* purely symptomatic, with *Mercurius* (3x) and *Kali iod.* (1x) as the chief remedies.

ACUTE YELLOW ATROPHY OF THE LIVER.

Synonyms.— Acute Parenchymatous Hepatitis, Malignant Jaundice, Icterus Gravus.

Definition.— An acute disease characterized by rapid atrophy of the liver with destruction of tissue, and marked by symptoms of profound disturbance of the system, jaundice, hemorrhages, toxemia, and malnutrition.

Pathology.—The liver is greatly reduced in size, usually to about one third its normal dimensions. The capsule appears wrinkled and in folds, and is of a light yellow color. The substance of the organ presents areas of a mottled yellow and red color, the latter representing the more advanced stages of the disease. Microscopic examination reveals extensive fatty degeneration and destruction of the hepatic cells, ending in their ultimate absorption. The gall bladder is usually empty and the common duct patulous. Crystals of leucin, tyrosin and bilirubin are found in advanced cases, and usually there is observed a small-celled infiltration of the stroma. The tissues of the body are deeply jaundiced, ecchymoses are present, and hemorrhages occur from various mucous membranes. The spleen is greatly enlarged and soft in well-marked cases, and there is fatty degeneration of the heart and kidneys.

Etiology.—Acute yellow atrophy may be either primary or secondary. Primary cases are exceedingly rare, and supposed to be invariably fatal. The causes are unknown, but as is usual under such circumstances, it is presumed by most modern investigators to be due to an unknown bacterial infection.

Secondary cases occur mostly in the female sex, and between the ages of fifteen and thirty-five, and is more liable to arise during the latter months of pregnancy, and also in the course of puerperal and other septic fevers. It is supposed to result in some instances from malarial poisoning. It follows poisoning by phosphorus in almost all cases, and may result also from poisoning by alcohol, arsenic, mercury, and antimony. It is occasionally found in the latter stages of cirrhosis and biliary retention.

Symptoms.—In the initial stage there are symptoms of gastro-duodenal irritation, nausea, vomiting and jaundice, the latter appearing to be of a simple nature. After a few days, or sometimes longer, nervous symptoms develop. The patient becomes restless and has a slight delirium. Violent headache supervenes and the delirium assumes an active form, amounting in some cases to mania and requiring physical restraint. At the same time there may be twitching of the muscles, trismus and convulsions. These symptoms gradually diminish and are succeeded, usually within forty-eight hours, by periods of stupor, which finally merge into coma and a general typhoid state, with low muttering delirium and extreme prostration. Jaundice gradually deepens as the disease advances, until it becomes quite pronounced. The occurrence of jaundice with cerebral excitement is always suggestive of this disease.

The temperature is usually normal or subnormal, or may be slightly elevated, but a high ante-mortem temperature is nearly always

observed. I had one case in which the temperature ranged very high after the first two days, the patient dying in five days. The pulse becomes rapid and feeble. The tongue, at first lightly coated, becomes covered with a thick, yellow fur, and is dry and fissured. Vomiting continues throughout the attack, later becoming severe, the ejecta containing blood and often giving a "coffee-ground" appearance. The bowels are constipated, the stools light colored or consisting of blood from intestinal hemorrhage. The urine is diminished in quantity, is high colored and shows increased specific gravity. The urea is greatly diminished and leucin and tyrosin are present. Cutaneous ecchymoses and hemorrhages occur, and the latter may also take place from any mucous membrane—nose, bowels, bladder, uterus, etc. It sometimes appears to occur as an endemic.

Physical examination shows a rapid diminution in the size of the liver, which is often reduced to half or even quarter of its normal size in a few days. As the flabby liver tends to drop back, there may finally be only a slight line of liver dullness in the axillary region, and no dullness at all in front. In extreme cases the edges of the organ can not be palpated under the costal margin. If the disease attack a previously enlarged liver, the diminution will be less marked. The organ is usually tender on palpation or percussion, though severe pain is of rare occurrence.

Diagnosis.—The diagnosis is easily made in typical cases when we find associated together jaundice, cerebral excitement, followed by coma, diminished size of the liver, hemorrhages and the presence of bile with leucin and tyrosin in the urine and enlarged spleen. It is very important, however, that no mistake be made in estimating the size of the liver.

The disease is very liable to be mistaken for phosphorus poisoning. Anders gives the following differential table :—

Acute Phosphorus Poisoning.

There is a history of accidental ingestion of poison (friction-match heads, rat-poison.)

The onset is sudden; violent nausea, vomiting, and pain over the region of the liver. Jaundice appears on the second or third day.

Nervous symptoms appear late in the disease—always preceded by jaundice.

The vomit and stools are phosphorescent. Black vomit precedes death.

Acute Yellow Atrophy.

There is often an endemic history.

A slow onset—malaise, slight fever, with nausea and vomiting; jaundice is a beginning symptom.

Nervous symptoms may appear early, often before the occurrence of jaundice.

Black vomit occurs early and persists throughout.

Temporary arrest of symptoms between the occurrence of jaundice and black vomit.	Progressive march of symptoms with no remission.
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Sarcolactic acid is present in the urine, and rarely leucin and tyrosin.	Leucin and tyrosin are common in the urine.
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Hypertrophic cirrhosis in its later stages may resemble acute yellow atrophy, but there is an enlarged liver, an absence of leucin and tyrosin in the urine, and the course of the disease is essentially chronic, with a usual previous history of alcoholism. In some cases it is impossible to diagnose acute yellow atrophy during life.

Prognosis.—The disease proves fatal in from five to ten days, though in rare cases it is more protracted.

Treatment.—This is purely symptomatic. *Phosphorus* (3x) is the remedy above all others bearing a likeness to the disease, and should be persistently administered. An ice-cap should be applied to the head during the cerebral excitement, at which time *Hyos.* proves of most value. Anders advises free stimulation to be "begun early and persisted in throughout the course of the disease." A rigid milk diet should be prescribed.

CIRRHOSIS OF THE LIVER.

Synonyms.—Interstitial Hepatitis, Fibrous Hepatitis, Sclerosis of the Liver, Nutmeg Liver, Hob-nailed Liver, Gin-drinker's Liver.

Definition.—An inflammation of the intervening connective tissue of the liver, chronic in its progress, resulting in an induration or hardening of the organ, and an atrophy of the secreting cells.

Pathology.—There are four well-characterized forms of cirrhosis: (1) Atrophic; (2) hypertrophic; (3) fatty; (4) perihepatic or Glissonian cirrhosis. The first two named are the leading forms. Osler thus describes the morbid changes:—

"*The Atrophic Cirrhosis of Lænnec.*—The organ is greatly reduced in size and may be deformed. The weight is sometimes not more than a pound or a pound and a half. It presents numerous granulations on the surface; is firm, hard, and cuts with great resistance. The substance is seen to be made up of greenish-yellow islands, surrounded by grayish-white connective tissue. This yellow appearance of the liver induced Lænnec to give it the name of cirrhosis.

"*Hypertrophic Cirrhosis.*—Enlargement of the liver occurs in the early stage of the ordinary atrophic cirrhosis, but the increase is moderate and largely due to hyperemia. The fatty cirrhotic liver is also large, and may reach a hand's breath below the costal margin. The term hypertrophic cirrhosis should be restricted to the form described by French writers, which is also known as *biliary cirrhosis*,

Unfortunately, this has been used by some writers to include as well the cases in which there has been permanent occlusion of the duct, either by stricture or a calculus; the induration, however, is slight under these circumstances and hypertrophy very rare. It seems best to limit the terms *biliary* and *hypertrophic* cirrhosis to the form characterized by permanent enlargement of the liver, a marked involvement of the smaller biliary canaliculi, and retention in an unusual degree, in comparison with atrophic cirrhosis, of the number and form of the liver cells, in spite of the great increase of the lobular connective tissue. In this form the liver is greatly enlarged; in one of my cases it weighed seven pounds. The surface is smooth, it is exceedingly firm, resists cutting, and presents on section a deep greenish-yellow color. All of my cases have been in hard drinkers.

“*Fatty Cirrhosis*.—Even in the atrophic form the fat is increased, but in typical examples of this variety, the organ is not reduced in size, but is enlarged, smooth or very slightly granular, anemic, yellowish-white in color, and resembles an ordinary fatty liver. It is, however, firm, cuts with resistance, and microscopically shows a great increase in the connective tissue. This form is quite as common in this country as the atrophic variety. It occurs most frequently in beer-drinkers.

“*Perihepatitis; Glissonian Cirrhosis*.—In this form the liver is greatly reduced in size, much altered in shape, and everywhere surrounded by a firm grayish-white membrane, sometimes of semi-cartilaginous consistence, varying from 10 to 15 mm. in thickness. This fibrous investment can be stripped off readily, and the liver substance may look almost normal, but usually shows cirrhotic changes. The capsular thickening may be slight, and the portal connective tissues chiefly involved. The capsule of the spleen is, as a rule, similarly affected, and both processes are associated with a proliferative peritonitis. The condition is most frequent as a result of alcohol, but occurs also in instances of cyanotic induration.

“The two essential elements in cirrhosis are destruction of liver cells and obstruction to the portal circulation.”

Etiology.—The chief cause of cirrhosis is the abuse of alcoholic liquors, especially the stronger kinds. The oftener they are imbibed and the larger the quantity consumed, the more quickly the disease occurs. Malt liquors and wines, containing less alcohol, are not so frequently a cause of cirrhosis, but if taken in excess, may produce the disease. Fusel oil is supposed to be the real etiological factor.

Cirrhosis may also result from the continued use of rich, spicy foods, and from the ptomaines and other alkaloids. The disease may

follow syphilis, rickets, diabetes, gout, malaria, scarlet fever or typhoid fever. It may also result from long-continued, passive congestion of the liver. In coal miners the disease may follow the swallowing of coal dust, which is deposited as solid pigment about the portal canal.

It occurs most often in men, because they indulge more freely in alcoholic liquors, and is most frequent between thirty-five and fifty years of age. It may occur in children, but if so, is usually of syphilitic origin, or follows scarlet fever.

Symptoms.—(1) *Atrophic Cirrhosis.*—The initial symptoms are often only those of a gastro-intestinal catarrh, or an alcoholic gastritis, with more or less symptoms of congestion of the liver. There are no indications of the real character of the disease, though a suspicion of the truth may be aroused by a history of alcoholism. It is not until the portal circulation becomes seriously obstructed that anything like diagnostic symptoms are recognized. Then the gastro-intestinal symptoms become more pronounced, and dyspepsia, vomiting and hematemesis occur, the latter sometimes being profuse and even fatal. Constipation, often with black, tar-like stools, is present, and from passive congestion of the inferior hemorrhoidal veins, hemorrhoids are often present. Enlargement of the spleen is present, and can usually be palpated. A troublesome meteorism occurs, varying according to the amount of gas present. The abdominal veins enlarge, especially on the right side, and other evidences of an effort to establish a compensatory circulation are evident. As the latter fails, ascites develops, the abdomen sometimes becoming enormously distended. Jaundice may be present in a mild form with the prodroma, but later, attacks of severe jaundice may occur from time to time, and toward the termination of the disease it is not unusual for the jaundice to become extreme and be associated with cerebral symptoms. The urine is small in quantity, high-colored, brownish, deficient in urea, but loaded with urates, which are deposited in great abundance along with much coloring matter. Edema of the feet and ankles succeeds to ascites, and the genitalia become much swollen. There is usually no fever, but in exceptional cases there may be a slight rise in temperature.

Toxic symptoms may develop at any time. The patient may become actively delirious, noisy and talkative; or he may become stupified, with periods of semicomatose and muttering delirium, or may even develop convulsions. These symptoms may be due to intense jaundice, to alcoholism, or to uremia, while in other cases the exact nature of the toxemia can not be ascertained. At no time is there pain or tenderness over the liver.

Physical examination reveals a distended abdomen, an atrophied

liver, an enlarged spleen, and enlarged superficial veins. The size of the liver and spleen can only be correctly estimated after a withdrawal of the ascitic fluids. If the cirrhosis occur in a liver previously enlarged by fatty or waxy changes, it may still be larger than normal, but smaller than at the beginning of the cirrhosis.

(2) *Hypertrophic Cirrhosis*.—In this variety the history of alcoholism is usually decided. The liver may be enlarged for a long time, months and even years, before subjective symptoms develop. Jaundice may come on suddenly, or gradually develop for a long time, but it is persistent and extreme throughout, though the feces may show bile coloring. Ascites is usually absent, although it may be present late in the disease. At any time symptoms of acute yellow atrophy may develop with a rapidly fatal termination. The tongue is dry, the temperature rises to 102°, to 104°, or higher, jaundice becomes intense, active delirium sets in, and convulsions follow. Enlargement of the liver may be the sole feature distinguishing the disease from acute yellow atrophy, except that leucin and tyrosin do not appear in the urine. In some instances the symptoms of acute yellow atrophy do not appear, the patient dying from emaciation and debility. The course of hypertrophic cirrhosis is from three to seven years.

(3) *Fatty Cirrhosis* and (4) *Perihepatitis* or *Glissonian Cirrhosis* usually present about the same symptoms as the atrophic variety. The former variety is often latent, and only discovered by accident in toppers who have died of other diseases. According to Osler, "the greater number of the cases, clinically diagnosed as cirrhosis with enlargement, comes in this division."

Diagnosis.—With the symptoms of cirrhosis present, and a history of alcoholism, the diagnosis should be comparatively easy, especially when we consider the fact that cirrhosis is more frequent than any other diseases for which it is liable to be mistaken. It is also an easy matter to elicit the fact that the ascites does not arise from any disease of the heart, lungs or kidneys. Anders gives the following diagnostic tables:—

Cirrhosis.	Carcinoma of the Liver.
History of alcoholism or of long-standing diseases.	Hereditary history.
Occurs in middle adult life (twenty-five to fifty years).	Usually occurs after forty years of age.
Occurs as a primary affection.	Often occurs as a secondary growth.
Jaundice is slight or intense, according to the variety; there is no cachexia.	Anemia is present, and also the development of a typical cachexia.

Tenderness is marked. The case runs a slow course, usually lasting many years.

Enlargement is regular in the hypertrophic form; there are no umbilications.

Cirrhosis.

History of alcoholism or chronic disease.

Occurs idiopathically.

Fever, jaundice and ascites may be present, singly or together.

Anemia and emaciation slowly progressive.

Enlargement or atrophy of the liver, according to variety of cirrhosis. No fluctuation or thrill.

Aspiration is negative.

Cirrhosis.

History of irritants (alcohol) or chronic processes (tuberculosis or gout), forming a growth of connective tissue.

Usually a slow course. There is tenderness, but no pain.

Hectic symptoms absent. Moderate fever appears late in the disease.

Runs a slow course, lasting months or years.

Slow enlargement, often regular, or slightly nodulated. No fluctuation.

Aspiration is negative.

Prognosis.—The prognosis is unfavorable, but not altogether bad. In the hypertrophic variety there is more hope of being able to mitigate the disease and prolong life than in the atrophic form. This, however, can not be accomplished unless the patient will abstain from alcohol. If he will do so and submit to proper treatment, he may enjoy comparatively good health for years. In atrophic cirrhosis, if a compensatory circulation is established, the patient may live for months, and even years, but as a rule a fatal termination is reached within from a few weeks to six months after portal obstruction takes place.

Treatment.—Abstinence from alcoholic drinks is of first impor-

There is more pain, with rapid emaciation. The case terminates usually within one year.

The liver is irregularly enlarged, and contains umbilicated nodules.

Hydatid Cyst.

History of the ingestion of the embryo of *tenia echinococcus* with improper food.

Simultaneous occurrence in colonies, or in others in the vicinity.

No fever, pain, jaundice or ascites.

Emaciation not marked.

On palpation an irregular, fluctuating tumor is felt over the hepatic area, giving an "hydatid thrill."

Aspiration gives a clear, serous fluid, rich in chlorides, and containing hooklets.

Abscess of the Liver.

History of dysentery, traumatism or pyemia.

Acute course, severe pain.

Hectic symptoms appear early (fever, chills and sweating).

Runs an acute course, lasting a few weeks.

Rapid development of a fluctuating tumor in the hepatic area.

The aspirating needle reveals the presence of pus.

tance. Highly seasoned foods, strong coffee, and diet known to irritate the gastro-intestinal tract should be prohibited. The diet should be of the simplest character, and the value of a prolonged milk diet can not be overestimated. Moderate systematic exercise, regular hours for eating and sleeping, daily baths and friction are all important. If symptoms of gastric catarrh be present, they should receive careful attention, daily lavage being usually of much service.

When the ascites becomes great and a source of distress and danger, tapping must be resorted to, and usually must be repeated frequently. Removal to a cool, dry, non-malarial climate is very desirable.

Therapeutics.—*Nux vomica* (3x) is the first remedy to be thought of, and will often be found to be indicated. *Arsenicum* (3x) probably comes next in order, and then follows *Cinchona*, *Merc. sol.* (3x) *Chelidonium* (2x) and *Bryonia* (2x). *Phosphorus* (3x), in its pathogenetic effects, more closely resembles cirrhosis than do those of any other drug, and if reports are to be trusted, it has cured many cases. Goodno says, his "most decided results have been gained from the persistent use of *aurum muriaticum* in the first to the third decimal triturations, prescribed largely upon the ground of its relationship to sclerotic processes. Proving also present many symptoms suggesting its applicability. It is recommended, as well as *iodide of potassium*, for cirrhosis developed in syphilitics. Whether iodide of potash possesses the power over simple cirrhosis, which some observers indicate, is questionable. Many cases of cure by *mercurius dulcis* have been reported, cases in which the diagnosis seemed established. Sior has recently reported an interesting case of the hypertrophic variety as cured by this remedy." I should use the second trituration. The persistent use of *Iodine* (1x) is said to have proved curative.

For the ascites, *Apis* (3x) and *Apocynum* (Tincture). For cardiac complications, *Digitalis*. For special indications the reader is referred to the therapeutics of gastric catarrh and jaundice.

ABSCESS OF THE LIVER.

Synonyms.—Suppurative Hepatitis, Hepatic Abscess.

Definition.—A circumscribed inflammation of the liver results in single or multiple abscesses. The abscess walls are irregular in character, and are composed of necrotic liver tissue in which is infiltrated more or less serum and pus. In long-standing cases there may be present a formation of connective tissue. The pus may have a normal appearance, or may be brownish or reddish in color from an admixture of blood and broken-down liver tissue. As a rule the pus has an offen-

sive odor. The abscess may be single or multiple. Multiple abscesses are found in pyemia and in suppurative inflammation of the portal vein or bile passages. They range in size up to that of a small orange. Single abscesses are usually much larger. A large majority of liver abscesses are located in the right lobe, usually toward the convexity, and have a tendency to point and rupture externally. Only a very small percentage rupture into the peritoneal cavity. As, however, the peritoneum is usually walled off by adhesions, such ruptures usually take place into adjacent organs, especially into the right lung and pleura. Rupture may occur into the pericardium, the vena cava, the intestine or the kidney. Rupture may occur into the gall bladder. In case a connective tissue formation takes place about the abscess, the latter may remain stationary, the contents becoming inspissated and cheesy.

Etiology.—Hepatic abscess may properly be classified as (1) *Tropical*, in which the disease is either idiopathic or follows dysentery, and for which no cause other than the effects of climate have been ascribed, save that bacteriologists claim the infection to be due to the presence of the *Amœba Coli*, though the symptoms of dysentery may be absent. This variety is usually single, but two or more moderately sized abscesses may be present. (2) *Pyemic*, which is the common form, and results from septic infection of some character. In this form the abscesses are always multiple. In a general way it may be said that the septic infection may attack the liver through several channels: 1. *Through the portal vessels, especially the portal vein.* Here the infection may arise primarily from intestinal ulceration, especially dysentery. It may originate in an appendicular ulcer or those of typhoid fever; also from abdominal abscesses and operations upon the rectum. It is not unusual in general pyemic processes or in bone suppurations for the germs to enter the venous circulation and finally reach the liver through the hepatic artery. This accounts for the fact that suppurative wounds of other parts, more especially of the head, are sometimes followed by abscesses of the liver. 2. *Through the umbilical vein.* This occurs rarely in newborn children, from infection of the navel. 3. *Through the bile duct.* On account of obstruction of the common duct, if a suppurative process is established from any cause, the pus germs may reach the liver tissue through the bile ducts, and an abscess result. 4. *Through traumatism.* The injury is usually over the liver. 5. *Foreign bodies and parasites.* Needles, fish bones, etc., suppurating hydatid cysts, and more rarely round worms and liver flukes.

Symptoms.—The initial symptoms of hepatic abscess are those indicative of a suppurative process. At the onset chills are common

and may be repeated more or less throughout the disease, especially when in multiple abscesses a new suppurative focus is found. Often the chills are irregular, and may alternate with fluctuations of temperature. The latter is irregular and intermittent, frequently remittent, usually suggestive of malarial fever, or it may be hectic in character. As the pyrexia declines there may be profuse sweatings, the latter also occurring when the patient sleeps. In long-standing chronic cases fever may be entirely absent. The respiration and pulse usually correspond with the temperature. Later the pulse becomes continuously weak and rapid, and the patient becomes greatly prostrated and passes into a typhoid state. In such instances there is usually tympanites, enlarged spleen, subsultus tendinum and muttering delirium. If the abscess perforates into the lung, it gives rise to cough, expectoration of pus, dyspnea, anemia, night sweats, etc.,—indicative of pulmonary abscess. The skin is sallow and slightly jaundiced, and appearance is cachectic. The bowels may be constipated, or there may be diarrhea with bloody stools. While the above symptoms are progressive, the patient complains of pain and tenderness in the hepatic region. If the abscess is centrally located, the pain is of a dull, boring character, aggravated by pressure and by lying on the left side, the latter causing in addition a peculiar pain of a heavy, dragging character. If the abscess be superficial, and involve the peritoneal covering, the pain is sharp and cutting. In case also the inflammation extend to and involve the diaphragmatic pleura, a true pleuritic pain occurs. The pain of hepatic abscess usually radiates to the right shoulder, owing to an irritation of the filaments of the phrenic nerves. In deep-seated abscess the tenderness is slight, but when superficially located, it may be extreme. Ascites may result if the abscess happen to press upon the portal vein, but it is never very marked. In case of a large, solitary abscess, physical examination reveals an irregularly large and tender liver. If the abscess be of great size, there is an appreciable bulging, though this varies with the location, and fluctuation may be observed. In multiple abscesses, the liver may be equally tender, but the enlargement is symmetrical and no bulging or fluctuation can be observed. An increased area of dullness is observed on percussion usually rising in the axilla to the fifth rib, and extending across the back to a level with the angle of the scapula. The dullness may be uniform, but this is rare. The fact that the abscess is usually located in the right lobe near the convex surface, accounts for the upward enlargement. This should be remembered as a valuable diagnostic point, as in other diseases of the liver, the enlargement is usually in a downward direction. Abscesses of the right lobe have a tendency to point in

the seventh and eighth spaces in the mammary line or below the costal arch. Abscesses of the left lobe usually point in the median line just below the ensiform cartilage. Rupture may take place into the lungs, pleura, pericardium or peritoneum, with the usual results consequent upon such an accident. If ruptured into the intestinal tract, favorable symptoms follow. Fatal abscesses of the brain have occurred from septic emboli lodging in the circle of Willis.

Some abscesses run a latent course, until rupture occurs, no characteristic symptoms presenting. In other cases the general symptoms are severe, but characteristic local symptoms are absent, and the case is easily mistaken for malarial fever or some other infective disease. In typical cases, death occurs from perforation into adjoining cavities or organs, or from septicemia. Chronic abscess may run a tedious and insidious course, with little pain and tenderness, only hectic symptoms well marked. In cases of multiple abscesses in the course of pyemia or malignant endocarditis, there may be no symptoms additional save a slight enlargement of the liver with moderate pain and tenderness.

Diagnosis.—If there is a large abscess, the diagnosis may be easy, but more often the case is obscure, and may so closely simulate other diseases that a correct diagnosis is extremely difficult. The history of the case as to evident causes and the presence of pus upon exploratory aspiration are the most essential diagnostic features. It must not be overlooked, however, that it is possible in aspirating to strike an empyema or an abscess of some other organ or cavity. It is therefore important to observe carefully the character of the pus withdrawn. If the latter show broken-down liver cells, bile pigment and the presence of amebæ, it is undoubtedly from the liver. If the case be one of malarial fever, the spleen is enlarged, and the blood shows the presence of the hematozoön of Laveran, and free pigment. Osler says that "an intermittent fever which resists quinine is not malarial." Empyema gives an entirely different previous history, and the characteristics of hepatic pus are not present unless it be that an abscess of the liver has ruptured into the pleural cavity, thus constituting a genuine empyema. Anders says that "the detection of the *Ameba Coli* in the sputum alone would set the diagnosis at rest." In empyema also the heart is displaced, and we find the usual symptoms attendant upon lung disease. Intermittent hepatic fever associated with gall stones closely resembles, clinically, an abscess of the liver. However, the attacks are more sudden and intense, jaundice is marked, the pyrexia shorter, and are separated by much longer intervals. According to Osler, "the presence of a leucocy-

tosis is a most important feature in all forms of suppuration of the liver.

Prognosis.—The prognosis is generally unfavorable, and in a majority of cases absolutely bad, unless efforts to open and drain the pus cavity are successful. The latter operation has reduced the mortality from two thirds to about one half. Multiple small abscesses are usually fatal. In a recent case of the latter, occurring in my own practice, which followed the use of antitoxine in a grave case of diphtheria, a child of eight years of age, recovered in about four months, her life being despaired of constantly during the first three months. In some cases the abscess is evacuated spontaneously into the intestine, or externally, and recovery follows.

Treatment.—If the pain is severe, hot poultices or hot fomentations should be applied. In some instances opium may be required to relieve the agonizing pain. The diet should consist chiefly of milk and nourishing broths.

THERAPEUTICS.

Belladonna (2x), is the first remedy indicated in the stage of congestion in a very large majority of cases. Not only is this drug more applicable than any other to a localized inflammation that tends to suppuration regardless of locality, but such a process, especially in the hepatic structure, seems particularly prone to develop the well-known distinctive characteristics of that drug. In pyemic cases, such symptoms would hardly be present, and in such, belladonna is of little service.

Bryonia (2x) may be required immediately after the symptoms calling for belladonna are modified, but only before suppuration begins, and in case the inflammation is superficial, involving the capsule, with characteristic symptoms of the drug. Sharp pains or transient stitches in the hepatic region; pain and soreness, worse on touch or deep inspiration; pain in right shoulder. Goodno is correct in his statement that bryonia "possesses little influence over infective cases tending to rapid formation of pus."

Mercurius is very frequently the remedy indicated next after belladonna, especially in infective cases. It is applicable at the beginning of a suppurative process, but is of little use later on. It will sometimes check the suppuration and cause absorption of the pus already formed. I generally use *Merc. sol.* in the third trituration. In one case, on account of some iodine symptoms present, I used *Merc. iod.* (2x) with excellent results.

Hepar sulph.—From the standpoint of suppuration this would naturally be the remedy next to be thought of, but this disease forms

an exception. *Hepar sulph.* seems to be of little service, and certainly the condition is one where the "promotion" of pus is not desirable.

Hering always claimed that *Hepar* in a high potency would check suppuration, but I have never been able to verify the statement.

Silicea.—In protracted cases this is undoubtedly a valuable remedy in controlling the suppurative process. Dickinson, in Arndt's System of Medicine, mentions a case where life was prolonged by the use of *Silicea* for eighteen months, the patient finally dying of general anasarca.

Chininum.—In cases developing a distinctive periodical character resembling malaria, quinine may be used for diagnostic purposes as previously suggested, but is seldom beneficial in controlling the symptoms. In such cases I much prefer the *Chininum Arsenicosum* (2x), which is often indicated, and is well adapted to the condition, covering not only the malarial symptoms, but also the pyemic state.

Arsenicum (3x) is a remedy of great value in pyemic cases, and where typhoid symptoms develop, with the characteristic restlessness of the drug, profound prostration, dry, brown tongue, etc. In the case where multiple abscesses followed the use of antitoxine in diphtheria, previously referred to, and which eventually recovered, *Arsenicum* 6x was the chief remedy used. Part of the time, on the advice of a consulting physician, *Arsen. iod.* 3x was substituted. Goodno prefers *Lachesis* in the low dilutions. The pathogenesis of this drug certainly places it at the head of all remedies for pyemia, but it seems to act satisfactorily only when it is thoroughly well indicated.

Surgical treatment consists chiefly in the opening and drainage of the abscess cavity. Recoveries have followed simple aspiration, which is, to say the least, a harmless experiment if strict asepsis be observed. Aspiration should be performed under ether, a long, fine needle, of not too small a caliber, being deeply inserted in the suspected location. In multiple abscess, operative measures should not be employed.

FATTY LIVER.

Varieties.—Two varieties are recognized: (1) Fatty infiltration, (2) Fatty degeneration.

(1) Fatty Infiltration.

Definition.—A deposit of fat in the hepatic tissues due to the ingestion of fats and albuminates in food.

Pathology.—Fatty infiltration occurs to some extent in normal livers. When it increases to such an extent as to become pathological,

the liver may become enormously large, the margins are rounded, and the substance on section presents a shiny, greasy appearance, with anemia; the color being of a light yellow or gray. The specific gravity of the organ may be so low that portions of it placed in water will float. The stroma is normal.

Etiology.—Fatty infiltration is usually associated with general obesity, and occurs from habitual overeating, especially of fatty foods, particularly in persons of indolent and sedentary habits and in drunkards. In the latter case it is often associated with cirrhotic changes. It may occur in connection with cachectic and wasting diseases, as in phthisis, anemia, carcinoma and chronic malaria. It may also be associated with fatty degeneration.

Symptoms.—General symptoms are usually entirely wanting, or the patient only complains of a sense of weight and fullness in the hypochondrium. After a time there is usually more or less anemia and debility, with a feeble and somewhat irregular heart action. Portal obstruction, jaundice, pain and tenderness are absent in this disease.

Diagnosis.—An obese person, with habits of life above mentioned and a smooth, enlarged liver, without pain or other evidences of portal obstruction, can be quite safely pronounced as having fatty infiltration.

Prognosis.—The prognosis in fatty infiltration is favorable, the functions of the liver being but slightly, if any, impaired.

(2) Fatty Degeneration.

Definition.—A disease characterized by changes within the liver cells, the albuminates being converted into fat, the substance of the liver destroyed, and the organ consequently atrophied.

Pathology.—The general pathological changes present a somewhat similar appearance to those of fatty infiltration with the important difference that the liver is atrophied instead of enlarged, and the cells are destroyed, the substance of the liver being soft and easily torn.

Etiology.—Fatty degeneration may result from any cause that interferes with a proper oxygenation of the blood, a process necessary to the normal removal of fats from the liver. This is the case with certain poisons, notably phosphorus. Also in certain wasting diseases, especially tuberculosis, carcinoma, chronic dysentery and profound anemia. Fatty degeneration may follow amyloid degeneration. It may result from the excessive use of malt and spirituous liquors, the alcohol burning up the oxygen that should usually be supplied for the aeration of the blood. It also occurs as a pathological feature of acute yellow atrophy.

Symptoms.—No definite symptoms can be described, but a great variety of symptoms may characterize an individual case depending upon the nature of the primary disease. As a rule, the pathogenesis of phosphorus presents quite an accurate picture of fatty degeneration. Symptoms of gastric catarrh are usually present, and frequently those of a fatty heart. Attacks of acute gastritis are not uncommon. Pain is not marked. Jaundice rare, though in exceptional cases malignant jaundice develops. If fatty degeneration of the kidneys complicate the case, the symptoms and morbid urine changes of that disease are present.

Diagnosis.—The presence of one or more of the etiological factors previously mentioned is the most important diagnostic point. The evidences of a gradual diminution in size of the liver, without symptoms of portal obstruction, is diagnostic. There is absent the suppurative symptoms and the cachexia of amyloid degeneration.

Treatment of Fatty Liver.

Enforced systematic daily exercise in the open air is advisable in most cases, except where contraindicated by complicating diseases. Regular bathing in salt water, followed by brisk rubbing is beneficial. Turkish and Russian baths judiciously administered are often of decided benefit. The diet is of greatest importance, and must be rigidly enforced. It should consist chiefly of lean meat, green vegetables and milk. Fruit may be taken sparingly. All fatty, farinaceous and saccharine foods must be interdicted, and alcoholic drinks absolutely prohibited.

Phosphorus (3x) is the only remedy that is known to be strictly homœopathic to the disease. Bayes and others claim to have used it with satisfaction.

Arsenic and *Iodoform* produce symptoms of fatty degeneration of the liver, but there have been no clinical verifications.

As a rule, the remedy will depend upon the symptoms of the primary or complicating diseases, and must be based entirely upon the symptoms present in the individual case.

AMYLOID LIVER.

Synonyms.—Waxy Liver, Lardaceous Liver, Amyloid Degeneration, Amyloid Infiltration, Albuminoid Infiltration, Amyloid Disease.

Definition.—A peculiar infiltration into, or a degeneration of, the structure of the liver, from the deposit of an albuminoid material which has been termed *amyloid*, from a superficial resemblance to starch granules.

Pathology.—The liver is uniformly enlarged, is firm and hard, and presents a pale, glistening, translucent appearance. On section the surface is anemic and whitish. The deposit begins in the arterioles and capillaries, finally closing them, and extending to the connective tissue stroma. The liver cells are not involved in the amyloid changes, but they may become atrophied from pressure, or may undergo fatty degeneration. The amyloid deposits show a mahogany color on the application of a solution of iodine with iodide of potash. Amyloid changes are found in the spleen, kidneys, intestines and other organs.

Etiology.—Amyloid disease is caused chiefly by long-continued tuberculous suppuration of the lungs or of bones. It may also be caused by syphilis or carcinoma, and occurs during prolonged convalescence from infectious diseases, especially malarial fever.

Symptoms.—There are no characteristic symptoms. There is an increased area of dullness over the liver and spleen. The patient becomes emaciated and anemic. There is no pain, jaundice or other evidences of portal obstruction. The urine is increased, and contains some albumen and waxy tube casts, due to amyloid changes in the kidneys.

Diagnosis.—With a progressive enlargement of the liver, and the causes before mentioned, especially prolonged suppuration, evidences of waxy changes in the kidneys and emaciation and anemia, the diagnosis is easy.

Prognosis.—The course is chronic, often lasting for years, and usually being present a long time before detection. The prognosis for recovery is unfavorable. Exceptional cases progress rapidly to a fatal termination. Death usually results from exhaustion, or some inter-current affection.

Treatment.—The diet should be practically the same as that recommended for fatty liver.

We know of no remedy that is homœopathic to amyloid disease. The treatment must be symptomatic and directed to the primary lesion. In tuberculous suppurations *Calc. iod.* (2x), and *Silicea* (6x) are most important. In syphilitic cases *Merc. sol.* (3x), *Nitric acid* (3x), *Kali iod.* (1x), *Aurum mur.* (3x) and *Hepar sulphur* (3x) are to be considered. Old school authorities recommend chiefly chloride of ammonium, with codliver oil as a nutritive, and dilute mineral acids as tonics.

CARCINOMA OF THE LIVER.

Synonyms.—Cancer of the Liver, Hepatic Cancer.

Definition.—A malignant growth of the liver which may be either primary or secondary.

Pathology.—Primary carcinoma may consist of one large growth of a grayish-white color, sharply outlined from the adjoining liver substance, or small nodular masses, irregular in size and shape, may be more or less generally distributed throughout the substance of the organ. These may be sharply defined, or may gradually and imperceptibly fade into the adjoining tissue. If the nodules are near the surface, they usually project more or less irregularly, and are often umbilicated. There is also a rare variety, known as cancer with cirrhosis, in which small cancer masses are scattered throughout the liver, and are surrounded with fibrous tissue. Medullary cancer may occur primarily as a large mass, or as secondary nodules scattered throughout the organ, and is the most common variety. Sometimes in secondary growths the liver attains enormous dimensions. The whole organ may be implicated or only one lobe. Hemorrhages may occur into the nodules, or there may be fatty degeneration of the cancer cells.

“Histologically, the primary cancers are epitheliomata, alveolar and trabecular. The character of the cells varies greatly. Some varieties are polymorphous; others, small polyhedral; and others, again, contain giant cells. In rare instances, as in one described by Greenfield, the cells are cylindrical. The trabecular form of epithelioma is also known as adenoma, or adeno-carcinoma.

“Secondary cancer shows the same structure as the initial lesion, and is usually either an alveolar or cylindrical carcinoma. Degeneration is common in these secondary growths; thus the hyaline transformation may convert large areas into a dense, dry, grayish-yellow mass.” (Osler.)

Carcinoma of the bile ducts may exist for a long time without being recognized. It is ordinarily associated with biliary calculi. The disease usually first attacks the fundus of the gall bladder, and may extend until the common, cystic and hepatic ducts are involved. Secondary nodules may also be present in contiguous tissues.

Etiology.—Cancer of the liver is most common in men and in advanced life. When occurring in women it is usually secondary to cancer of the breast or uterus. Many authors claim that cancer of the liver is more frequent in women, but such has not been my experience, and I find recent authors agree with me. The disease is undoubtedly often hereditary. Secondary carcinoma of the liver may follow cancer located at any point supplied by the portal vein, notably in the rectum or stomach. It may also occur by direct extension from cancer of the pylorus, colon, pancreas or omentum.

Symptoms.—Often no definite symptoms are noticed until a cachexia has developed. Evidences of gastric catarrh are usually

present, but nothing that would excite suspicion as to the real nature of the disease. The chief local symptoms are pain and tenderness, though even where the liver is enormously enlarged by cancer, pain may be entirely absent. The pain is dull and boring in character, usually steady and quite severe, is located in the right hypochondrium, often extending to the back, and especially if the gall bladder be involved, may extend to the right shoulder. Jaundice, in a mild form, is present in about half the cases. If the common duct is obstructed, the jaundice may be severe. It should be remembered that the cachectic appearance may be mistaken for jaundice, but the conjunctivæ and urine are not discolored. Ascites is uncommon, and does not occur unless the peritoneum be invaded by the disease, or, more often, the portal circulation become obstructed. It is present, however, in cancer with cirrhosis. Cachexia develops sooner or later and is usually so decided that it alone would determine the presence of carcinomatous disease. In the latter stages of the disease there is usually some fever which may be intermittent and irregular. Toxemia is sometimes, but rarely, present; severe headache and delirium being present in but few cases.

Physical examination reveals enlarged superficial veins and an enlarged liver moving up and down with the respiratory movement. The size sometimes becomes enormous, often reaching from the third rib to the iliac spines and in some instances extending below the umbilicus. If the patient be much emaciated the cancer nodules can be easily detected, even the umbilicated characteristic being plainly felt. The margin of the liver is irregular and nodular, and the contour of the lower border is readily made out. In cancer with cirrhosis the outlines are symmetrical. There is dullness on percussion over the diseased area. Tenderness is almost invariably present. The spleen is enlarged in about half the cases, and there may be some ascites. The course of cancer of the liver is from three to fifteen months. As a rule, if a patient with an enlarged liver is in fairly good health at the end of a year, the enlargement is not due to carcinoma.

Diagnosis.—An enlarged or progressively enlarging liver, with a nodular surface and the characteristic cachexia is easily diagnosed as cancerous; especially if there be some jaundice and ascites, and more particularly, if there be a cancerous family history and the patient be past middle life. Primary carcinoma of the gall ducts can rarely be diagnosed. The presence of cancerous disease in other organs is of importance in establishing a diagnosis. The chief diagnostic point between cancer of the liver and cancer or benign growths in neighboring organs is that the latter do not have the regular downward and

upward movement during inspiration and expiration. Growths of the pancreas often form an attachment to the liver and thus render a diagnosis impossible. Anders gives the following differential diagnostic table between carcinoma of the liver and hepatic abscess:—

Carcinoma of the Liver.

Is often hereditary. There is a history of a primary growth.

Occurs usually after the age of forty.

Jaundice is rare.

Fever is absent or slight.

Cachexia is present and almost pathognomonic.

Pain is dull and boring in character, and more constant.

A nodular, umbilicated tumor or tumors may be detected.

The enlargement is downward.

The duration is a few months to one year.

Microscopic examination reveals dis-integrated liver cells, cancer-nests, and in some cases the micro-organisms of suppuration.

Hepatic Abscess.

There is a history of traumatism or of intestinal ulceration, as in dysentery.

Occurs at any age.

Jaundice is sometimes present.

Hectic temperature, chills and sweating.

Anemia may be present, but *never* cachexia.

Pain is sharp, lancinating, and paroxysmal.

A fluctuating tumor may sometimes be detected below the costal margin.

The enlargement usually upward.

The duration is usually a few weeks.

The microscope reveals pus, liver cells, staphylococci and streptococci, and in some cases the ameba coli.

The *prognosis* is invariably fatal. Secondary cases run the most rapid course, death sometimes occurring in from three to four months.

Treatment.—The treatment is purely symptomatic and palliative. If the pain is severe, opium should be used. Gastric symptoms should be combated by indicated remedies, for which consult the therapeutics of that disease. As a rule *Arsen.* (3x), *Nux vom.* (3x), *Conium* (3x) and *Carbo. veg.* (30x) are oftenest required and of most service. The diet should be well regulated, and consist chiefly of soups, lean meat, vegetables and milk. Should ascites become troublesome, the fluid should be aspirated.

HYDATID OF THE LIVER.

Synonyms.—Hydatid Cysts of the Liver, Hepatic Cysts, Echinococcus of the Liver.

Definition.—Cystic formations of the liver developed by and around the echinococcus when the latter has found its way into and penetrated the substance of the liver.

Etiology.—The echinococcus is the larval stage of the tapeworm, *tenia echinococcus*, found in the intestine of the canine family—the dog, fox, wolf and jackal. The adult worm is about one fourth of an inch in length, and has four segments, the last being alone mature and containing the eggs. This makes its escape with the dejecta of the animal, and contaminating the food or drink of man, finds its way into the human body and buries itself in various organs, more especially the liver, and there develops the pathological process which results in the echinococcus disease or hydatid cyst. The dog being the only domesticated species of the canine family, it becomes the only source of human infection. The disease is quite common in Iceland where dogs, more than anywhere else, are allowed great household privileges. It is claimed that one seventh of all the deaths in that country are due to hydatid disease. In this country the echinococcus disease is very rare. The parasite has an undoubted predilection for the liver, but nearly all organs and tissues may become infected by it, more particularly the lungs, intestines and brain. Women and children are more often affected than men, and the young rather than the old.

Pathology.—Any part of the liver may be involved, but the right lobe is most often affected. The cysts are usually single, but may be multiple. Their size ranges from that of a pea to an enormous size, sometimes completely filling the abdomen. In the latter case, pressure upon neighboring organs may cause severe functional disturbances. The original or “mother cyst” contains, floating in its fluid, numerous secondary or daughter cysts, varying in size from that of a mustard seed to that of a walnut. The growth of hydatid cysts is very slow, usually extending over many years. In some instances spontaneous recovery occurs by means of a capsule of connective tissue being formed, the cyst wall becoming calcified; and expansion and growth being prevented, the parasite dies. In other instances perforation may take place into various cavities and organs with the usual consequences of abscess perforation in the same locality. In a few cases suppuration of the cyst takes place, and assumes the character of an abscess of the liver.

Symptoms.—There are no symptoms until the tumor has attained sufficient size to produce disturbances due to pressure of the enlarged organ, when the sense of weight, dragging and of the embarrassment of breathing are the principal features. Pressure on the portal vein may cause enlargement of the spleen, gastro-intestinal disturbances and ascites. Pressure upon the hepatic vein or vena cava will cause edema of the lower extremities. Pressure on the bile ducts produces jaundice. If the cyst suppurates, there is obtained symptoms of hepatic abscess and pyemia. The cyst may rupture into various organs and

cavities, producing symptoms characteristic of the locality which is the seat of the perforation. Urticaria often follows the rupture of cysts, and the same has been observed after aspiration, and is probably due to the absorption of toxic materials.

Physical examination reveals an irregular and greatly enlarged liver, with more or less bulging anteriorly, according to the size and location of the cyst. Usually the surface of the liver is smooth and free from nodules. If the cyst or cysts are superficial, there is fluctuation either over the whole mass or in irregular-sized spots. If deep-seated, the feeling is elastic, but fluctuation is not observed. The "hydatid fremitus," or thrill, is often felt, which is a trembling impulse, described as like the "quivering of jelly." This is not always present; but when observed, it is of great diagnostic importance, as it occurs in no other class of liver tumors. Percussion reveals dullness over the area of the tumor. According to Santoni percussion over the tumor gives a sharp booming sound, which he likens to that produced "by striking a membrane stretched over a metallic frame."

Diagnosis.—If physical examination reveal the peculiarities above mentioned, and at the same time there is a marked absence of subjective symptoms, hydatid disease may be suspected. A positive diagnosis can only be made by examining the cyst contents, for which purpose exploratory aspiration is required unless rupture has already occurred into some favorable locality. The watery character of the discharge and the presence of free hooklets is sufficient to establish the diagnosis beyond doubt.

Prognosis.—While the progress of the disease is very slow, often lasting many years, yet the prognosis is rendered grave from the variety of serious complications that may at any time take place. Either the great size of the tumor causes pressure upon various organs and parts as already mentioned, with ultimately fatal consequences, or perforation takes place, and the contents discharge into the peritoneal cavity or some other dangerous locality. If into the heart or inferior vena cava, death results very suddenly.

Treatment.—There is no medicinal treatment. Recent surgical experiences are quite encouraging. As soon as the diagnosis is established the cyst should be extirpated without unnecessary delay. Some authors recommend evacuation of the cyst by aspiration.

VIII. DISEASES OF THE PANCREAS.

PANCREATIC HEMORRHAGE.

Pathology and Etiology.—Hemorrhage into the pancreas is of very rare occurrence, and its causes are practically unknown. According to Freidreich it is chiefly due to passive hyperemia in the pancreas resulting from organic diseases of the heart, lungs or liver. Injuries and alcoholism appear to bear some etiological relation to the condition. The hemorrhage usually occurs in circumscribed spots throughout the substance of the pancreas, and may also involve the adjacent subperitoneal tissue, and even the omentum, mesentery and kidneys. Fatty degeneration of the pancreas frequently coexists.

Symptoms.—The onset is characterized by sudden and agonizing pain in the upper part of the abdomen, which rapidly increases in intensity, and is soon followed by nausea, vomiting and abdominal tenderness. The patient soon becomes anxious and restless, and passes into a fatal collapse. Death usually occurs in from half an hour to twenty-four hours.

Treatment.—As recovery is only theoretically possible, efforts at treatment must be directed toward palliation of the pain and the administration of stimulants to control the collapsed condition.

ACUTE PANCREATITIS.

Varieties.—Fitz recognizes three varieties of acute pancreatitis: (1) Hemorrhagic; (2) Suppurative; (3) Gangrenous. This classification is a convenient one to follow, but as a matter of fact, the character of the primary inflammation is always the same, and it may go on to abscess or gangrene, precisely the same as a similar inflammation might do in other organs or tissues. Parenchymatous and interstitial varieties of pancreatitis are said to sometimes follow infectious fevers.

ACUTE HEMORRHAGIC PANCREATITIS.

Pathology.—The organ is enlarged, and is infiltrated with blood which is sometimes found in clots. Usually there is also found small areas of opaque white tissue which are known as fat-necroses. The adjacent tissues may also be found to be hemorrhagic, and may show the presence of fat-necrosis. The latter condition is due to the crystallization of fat, as it contains fatty acids combined with lime or lime-salts.

Etiology.—Acute hemorrhagic pancreatitis may follow pancreatic

hemorrhage. It is also supposed to result from alcoholism, chronic gastric catarrh, gall stones and traumatism. A prolonged course of mercury has seemed to have a causal influence; the condition has also followed glycosuria. (Anders.)

Symptoms.—An attack is ushered in with sudden and intensely violent pain in the epigastric region, or it may be more general. Nausea and vomiting are incessant and constipation is present. In some cases there is diarrhea, with the watery stools containing free fat. (Anders.) The temperature is usually normal or subnormal, but there may be a slight elevation. The abdomen becomes tympanitic and tender. Collapse symptoms rapidly supervene, and according to Fitz, death results from the second to the fourth day. Osler refers the cause of the sudden pain and collapse to involvement of the celiac plexus and stretching of the nerves by the swelling. Anders thinks it may also be due to a circumscribed peritonitis.

Diagnosis.—The disease is most liable to be confounded with perforative peritonitis or obstruction of the bowels, and a positive differential diagnosis is often impossible. In peritonitis the temperature is usually much higher, and the pain and tenderness less constant. In obstruction of the bowel, the general symptoms and the methods of diagnosis suggested under that head may be sufficient to establish the nature of the condition.

Prognosis.—Osler reports one recovery, and probably other cases have recovered where the condition was not recognized, but as far as our knowledge goes, the disease is almost invariably fatal, death usually occurring in from three to six days.

Treatment.—Heretofore the treatment has simply been one of palliation and stimulation. However, as our knowledge of pancreatic disease is quite recent, we do not yet know what may be expected from homœopathic remedies. *Belladonna* (3x) is in all probability the most efficacious remedy in the first stage. Later we would think of *Merc. sol.* (3x) or *Arsenicum* (3x). *Iris vers.* (2x), is supposed to have a specific and powerful action upon the pancreas, and if anywhere, it ought to be useful in pancreatitis. It has been recommended by Hughes, Farrington and others. *Phosphorus* (3x) is also supposed to act upon the pancreas, and has thin, watery stools containing fat. It also covers quite well the gastric symptoms of pancreatitis, and may prove to be a valuable remedy. Goodno reports favorable results in one case from the use of *Merc. bin.* Unfortunately the attacks come on so suddenly and the pain is so intense and agonizing in character that the use of opium as a palliative can scarcely be avoided.

SUPPURATIVE PANCREATITIS.

Pathology and Etiology.—The specific causes of this form of pancreatitis are unknown. Probably the primary inflammation is due to the same causes as have been mentioned under the hemorrhagic variety.

“Anatomically, there may be a diffuse suppuration throughout the organ, which is studded with small abscesses. In other instances the abscess cavity is large, and the pancreas is converted into an irregular cyst filled with creamy pus. In more chronic cases the abscess may be circumscribed and the contents cheesy. Communications sometimes occur with the duodenum, or the abscess may burst into the peritoneum.” (Osler.)

Symptoms.—Acute attacks are ushered in with pain in the epigastrium, vomiting and prostration. Septic symptoms soon develop, chills and irregular pyemic temperature. Distention and tenderness become extreme, and are often limited to, or at least much worse over, the left half of the abdomen. There may be slight jaundice, and often constipation followed by diarrhea. Death occurs in from one to two or three weeks.

“Rupture of the circumscribed peritoneal abscess, evidenced by copious dejections in which the sloughing pancreas has been found, and rapid diminution in the size of the abdomen, may take place.” (Anders.) Some cases run a more chronic course. In such the fever is slight or entirely absent. Pain is only moderate and tenderness can only be elicited by pressure over the pancreas. The patient becomes weak, emaciated and anemic, and dies from exhaustion in from six to twelve months. The *diagnosis* is impossible during life. The *prognosis* is invariably fatal. The *treatment* is entirely palliative and symptomatic, the usual remedies for suppurative and pyemic states being indicated.

GANGRENOUS PANCREATITIS.

According to Fitz, hemorrhagic pancreatitis not terminating fatally or in improvement within a week usually results in gangrenous pancreatitis. According to the same author, the disease may result also from perforative inflammation of the gastro-intestinal or biliary tract, or from the simple extension of a catarrhal inflammation of those tracts into the pancreatic duct. The organ may lie nearly free or even entirely sequestered in the omental cavity. In most cases it has degenerated into a dark-colored, offensive mass, which may be discharged through the intestines. As a rule, however, a fatal peritonitis is established. Hemorrhagic pancreatitis may also be

present. In some cases the diseased organ is contained within an abscess cavity, which gives the signs of a tumor located usually just above or to the left of the umbilicus. Death usually occurs within two or three weeks, the patient passing into a collapse.

CHRONIC PANCREATITIS.

Pathology.—The pancreas may be enlarged or diminished in size and indurated on account of a great increase in the interstitial connective tissue. The glandular substance may become changed or atrophied, in some instances entirely obliterated.

Etiology.—Chronic pancreatitis is most often due to inflammation of the pancreatic duct, and may follow an attack or attacks of the acute disease. It may be due to congenital syphilis and also to chronic alcoholism. The etiology of the disease is very little understood.

Symptoms and Diagnosis.—There are no characteristic symptoms. Usually symptoms of chronic gastric catarrh predominate and often obscure the real condition. The stools may be fatty, and slight jaundice, from pressure on the common duct, may occur. Moderate epigastric pain and tenderness are usually present, and sometimes there is observed, on palpation, a sense of resistance over the pancreas. Progressive emaciation and prostration are marked. The disease is frequently found associated with diabetes. Ascites sometimes develops late in the course of the disease.

Prognosis.—The prognosis is always grave but not hopeless. A large portion of the gland may become functionless and yet the general health be not greatly impaired. If glycosuria is permanently present, the case is hopeless.

Treatment.—Fatty and starchy foods should not be allowed, and a generally nutritious diet prescribed. Pancreatin or minced pancreas is recommended to be given after meals. Anders recommends malt diastase with alkalies. Remedies should be prescribed according to the symptoms of the individual case, and are usually selected from such as are oftenest required in the treatment of chronic gastric catarrh and diabetes.

PANCREATIC CYSTS.

Etiology.—Pancreatic cysts usually result from occlusion of Wirsung's duct by pancreatic calculi, or from biliary calculi becoming impacted at the orifice of the common duct. Wirsung's duct may become obliterated by pressure from without, from cicatricial constriction or from displacement.

Pathology.—Pancreatic cysts may be large or small, single or

multiple. They are filled with an alkaline grayish fluid which emulsifies fats, converts starch into glucose, and, more rarely, digests albumen. Later the contents may become of a dark brown or chocolate color from hemorrhagic infiltration. Atrophy of the organ often ensues.

Symptoms. — There are no characteristic subjective symptoms, until the tumor has attained sufficient size to produce pressure symptoms. Pain is often a prominent symptom, but there is nothing diagnostic in its character. Jaundice, ascites and fatty stools are sometimes present, the two former especially with large tumors. Albuminuria and glycosuria are present in exceptional cases. Physical examination reveals a smooth, globular tumor, resistant and sometimes fluctuating, especially if it be of large size. The location may be to the right or left of the median line, according as to which portion of the gland is involved, but more often to the left. Large tumors may extend until one occupies the entire abdominal cavity, and in such cases the usual mechanical effects from pressure are produced. Such cases, if occurring in women, are usually diagnosed as ovarian cysts. A deceptive pulsation is sometimes transmitted from the aorta, and auscultation may reveal an aortic murmur. The course may be rapid, the cyst developing within a few weeks, but more often it is slow, and covers a period of months and even years.

Diagnosis. — This is often extremely difficult, even a test of the aspirated fluid not being reliable. The characteristics of the tumor, and the absence of the symptoms and history of the affections with which it may be confounded, especially ovarian cysts and dropsy of the gall bladder, may suffice. The *treatment* is purely surgical, consisting of incision and drainage, which usually offers a favorable prognosis.

CARCINOMA OF THE PANCREAS.

Pathology. — Cancer of the pancreas may be primary or secondary, but the former is more frequent. The variety is usually scirrhus, and may be limited to the head of the pancreas, or involve the whole organ, and may spread to the stomach, the intestines, the peritoneum and the liver. The tumor sometimes reaches to the size of a cocoanut. Adhesions to adjacent organs may take place, and the pancreatic duct may be occluded, causing retention of cysts.

Symptoms. — The symptoms are variable and obscure and of very little value for diagnostic purposes, a positive diagnosis being rarely possible. Symptoms of gastric catarrh, with loss of flesh and strength and a cancerous cachexia constitute the usual picture. Epigastric pain and tenderness are usually present. Jaundice is present

when the head of the pancreas is involved. Ascites occurs if the portal vein is obstructed by pressure. The stools are often fatty, and usually contain undigested food. Glycosuria may be present. According to Fitz, carcinoma of the tail of the pancreas may be a cause of hydronephrosis of the left kidney from pressure upon the ureter.

Diagnosis.—The disease can scarcely ever be distinguished from cancer in the pyloric zone with involvement of the glands in the hilus of the liver. The movable character of the pyloric tumor and the absence of the hydrochloric acid in the vomit are valuable points. Tumor of the transverse colon is more superficial and movable, is often associated with temporary obstruction, and there may be hemorrhage from the bowels. In a case with progressive emaciation, epigastric pain, and deep-seated, immobile tumor, with the presence of fatty and greasy stools and the gradual development of jaundice, the diagnosis of cancer of the pancreas is probable.

“As the wasting proceeds, the aortic pulsation is transmitted with great force through the pancreas and transverse colon, and when a tumor is present, the diagnosis of aneurysm may be made; but in the latter, the sac has not an up-and-down jerking pulsation, but is distensible. In doubtful tumors in this region, the examination should also be made in the knee-elbow position.” (Osler.)

Prognosis.—The duration of the disease is usually from six to twelve months, and the result is invariably fatal.

The *treatment* is purely symptomatic.

PANCREATIC CALCULI

Pathology.—These are calcium carbonate or calcium phosphate concretions, containing usually a nucleus of inspissated mucus. They are of a grayish-white color, more or less rounded in form, and vary in size from a grain of sand to an almond. Sometimes fistulous openings are formed into the colon, the stomach or the peritoneal cavity.

Etiology.—Pancreatic calculi are supposed to result from a catarrh of the pancreatic ducts with retention or abnormal composition of the pancreatic secretions, or from obstruction of the duct.

Symptoms and Diagnosis.—The symptoms are obscure and indefinite. Mild paroxysms of pain, constituting pancreatic colic, may occur during the passage of the calculi. This mildly resembles biliary colic, and often the two can not be differentiated. Jaundice is never present, the stools are often fatty, glycosuria is sometimes observed, and the pain radiates to the left and back rather than to the right side

as in biliary colic. The discovery of pancreatic calculi in the stools is the only certain diagnostic point.

The *prognosis* is uncertain. The *treatment* is entirely symptomatic. For the colic, the same measures of relief may be used as for hepatic colic.

IX. DISEASES OF THE PERITONEUM.

ACUTE PERITONITIS.

Definition.—An acute inflammation of the peritoneum. It may be partial or circumscribed, being limited to only a portion of the membrane, or general, involving the whole peritoneal sac.

Varieties.—In addition to the two general subdivisions of peritonitis above mentioned, the disease is also classified according to the character of the exudate (*vide* Pathology). Also for convenience, the disease is clinically classified, several varieties being recognized regardless of pathological changes. *Erysipelatous peritonitis* occurs as a sequel or complication of the exanthem in adynamic fevers and in puerperal peritonitis. *Adynamic peritonitis* includes all forms in which there is a rapid tendency toward a typhoid condition, the tongue being dry and brown, the teeth covered with sordes, and low, nervous symptoms predominating. *Puerperal peritonitis* includes all cases which occur during the puerperal state. It must, however, be born in mind that here reference is not made to puerperal fever in general, for this does not necessarily include a peritoneal inflammation, but only to that form of puerperal fever which is characterized by peritonitis with or without pyemia. *Traumatic peritonitis* results from mechanical injury. *Infantile peritonitis* occurs during infancy and childhood, and even during intrauterine life. This variety has usually been made to include *tuberculous peritonitis*, the consideration of which will be found in the chapter on tubercles of the peritoneum. *Partial or circumscribed peritonitis* is often designated according to the locality affected, the name indicating the viscus in which the peritoneal investment is involved, as *perihepatitis*, *perisplenitis*, *perimetritis*, *perityphlitis*, etc. *Pelvic peritonitis* denotes an inflammation limited to the peritoneal covering of the female pelvic viscera, and is of a very common occurrence; its presence is often overlooked, its symptoms being referred to other causes.

Pathology.—The pathological character of peritonitis does not differ essentially from that of other serous inflammations. The morbid appearances are first an occurrence of hyperemia, the capillaries being

distended even to such an extent as to cause extravasations of blood at various points. Subsequently, the redness consequent upon this condition disappears, and the surface soon becomes cloudy from loss of its epithelium, and presents a velvety appearance, due to a proliferation of the connective tissue composing the peritoneum. The normal secretion is arrested, and an abnormal dryness occurs, which, however, is soon followed by the exudation so characteristic of peritonitis, and which never fails to appear, though it may vary greatly in character and amount. First, an effusion takes place which forms a thin, transparent covering upon the peritoneum, of a grayish-yellow color, readily detached, and which loosely connects the various organs. In other cases the deposit is a thicker, less transparent, yellow, croup-like membrane, and, in the dependent parts of the abdomen, there is a moderate amount of cloudy, flocculent serum.

Again, there may exist a great quantity of exudation. When the abdomen is opened, an immense amount of turbid, flocculent fluid escapes, while still more remains in the abdominal cavity. Besides the membranous deposits covering the peritoneum, we find numerous yellow clumps of coagulated fibrin which partly swim in the fluid, partly sink, and collect in the dependent portions of the abdomen. (Niemeyer.) The pathological classification according to the nature of the exudate is described by Bauer as (1) *Plastic or fibrinous effusion*, with an exceedingly slight quantity of fluid, hence, dry or adhesive peritonitis. This forms a continuous false membrane which invests the abdominal viscera, or sometimes, instead of being continuous, occurs only in patches. This further results in the formation of adhesive connective tissue which binds the various organs and tissues together, producing permanent displacements, fixing organs, and causing constrictions in organs which happen to be included in the firm retraction of the new formation. (2) *Serous and sero-fibrinous effusion*, where it approaches in its character pure ascitic fluid; it is yellowish-green or milky-white, turbid, and flakes and separate pieces of false membrane are suspended in it. The quantity may be enormous, especially in terminal peritonitis supervening on ascites, but in other cases it is much less. After the fluid has been absorbed, all further alterations proceed as with the fibrinous variety. (3) *Purulent effusion*.—This may be either a thickly fluid pus, or a very mobile, purulently turbid fluid, and is found in the most dependent parts, unless sustained by matting and adhesions. This form may be associated with suppuration of the peritoneum consequent upon ulceration of the same, or as a result of long contact with masses of pus, or from perforations and escape of purulent or decomposing matters into the peritoneal sac. It thus

constitutes the most frequent variety of exudation met with. (4) *Hemorrhagic effusion*.—This occurs in cases of traumatic origin and in the carcinomatous and tuberculous forms.

In cases of recovery, absorption of the fluid takes place rapidly, and suspended particles, flakes, coagula or pus undergo fatty metamorphosis, become fluid, and are absorbed; but partial thickenings and adhesions of the peritoneum always remain. In partial peritonitis the changes are similar, only limited to the part involved. If the exudation be of the fibrinous variety, the process often results in adhesion of the inflamed parts. If the exudation be serous or sero-fibrinous, portions may become capsulated and run the usual course.

In pelvic peritonitis, the changes are not essentially different from those in general peritoneal inflammation. The most characteristic feature is the deposition of lymph and serous or purulent fluid into the cellular tissue about the uterus, which, in the second stage, imparts to the sense of touch a feeling as if hot lead had been poured into the tissues and allowed to cool, rendering the roof of the pelvis hard and unyielding. The uterus is usually displaced, and its appendages seem solidly fixed, being held immovable by the surrounding elements. The subsequent processes of absorption or purulent degeneration and the formation of adhesions do not differ from the same in other varieties of peritoneal inflammation.

Etiology.—*Primary or idiopathic* peritonitis is of rare occurrence, but may result from exposure to intense cold or to sudden changes when overheated. *Secondary* peritonitis occurs from an extension of some lesion of the abdominal viscera, an occurrence likely to take place since the connective tissue stroma of these organs and the serous membrane form one continuous whole. Thus the various pathological processes set up in the organs may give rise to a local inflammation of the contiguous peritoneal investment, which may either remain circumscribed and constitute what is termed partial peritonitis, or may extend and become general; of this nature, is the peritonitis accompanying gastritis, hepatitis, splenitis, or dysentery, or which results from typhlitis, strangulated hernia, internal strangulations, or intussusceptions of the intestines, or pelvic peritonitis, by the extension of local inflammation in the uterus and its associate organs.

Probably the most frequent cause of peritonitis is perforation of the stomach or intestines, more often of the latter, the gaseous and other contents of the alimentary canal escaping into the peritoneal cavity, and exciting inflammation. This may occur in connection with gastric or duodenal ulcer, or result from the intestinal ulceration incident to typhoid fever, tuberculosis or appendicitis.

Perforation, leading to peritonitis, may also result from mechanical violence. Foreign bodies, such as intestinal calculi or parasites, finding their way into the peritoneal sac, either with or without previous ulceration, may excite peritonitis.

Peritonitis may result from menstrual congestion, or the habitual suppression of the menses, or suppressed lochia, and may follow the injection of cold water or irritating fluids into the cavity of the uterus. It may arise from septic influences; this is frequently observed in Bright's disease and in connection with the puerperal state. The condition known as puerperal fever usually, but not necessarily, involves an inflammation of the peritoneum. This may be a simple inflammation proceeding from the uterus and its appendages, such as may take place independent of the puerperal state, or more often, it may be the result of pyemic or septicemic influences, and thus may be conveyed by contagion, becoming epidemic, especially in lying-in hospitals. That this condition is not dependent upon the puerperal state, *per se*, but rather upon the blood-poisoning, is evident from the fact that the same conditions may arise after surgical operations upon the organs. The prevalence of epidemic erysipelas during an epidemic of puerperal fever, and the apparent production of the latter by the *contagium* of the former, would seem to establish an intimate etiological and pathological relationship between the two.

Peritonitis may also occur as an intercurrent malady during the course of erysipelas and other blood diseases, such as pyemia, smallpox, glanders, rheumatism, etc. Sometimes it is the result of metastasis in rheumatism, erysipelas, and the exanthematous fevers, in the latter accompanied by retrocession of the exanthem. During infancy, and even in the later months of fetal life, peritonitis may occur from other causes, chief of which is the puerperal infection consequent upon the presence of an epidemic of puerperal fever, especially in lying-in institutions, and gangrene and inflammation of the umbilical vessels, and umbilical hernia; usually, however, ante-natal peritonitis is supposed to be due to the presence of syphilitic taint in the mother.

Pelvic peritonitis is a form of partial peritonitis, but it is, to a great extent, etilogically distinct from other varieties, and is of far more frequent occurrence. When occurring after parturition or abortion, it may assume the features and course of puerperal peritonitis. It may also occur from an extension of gonorrheal inflammation, or ovaritis, endometritis, or salpingitis; or from the escape of fluids through the Fallopian tubes into the peritoneum after intrauterine injections. A case of this kind once came under the writer's observation, when a prostitute, suffering from a slight gonorrheal endo-

metritis, fell into the hands of a reckless and ignorant physician, who injected a strong solution of chromic acid, producing at once a violent metroperitonitis, from which the woman barely recovered. A few weeks after recovery, the original trouble not having disappeared, the same physician resorted to the same injection, again resulting in a similar, but not so violent attack of inflammation. After this, occasional attacks of inflammation occurred, until death finally resulted about two years after the first attack. Pelvic peritonitis most often arises from disorders of menstruation, the result of imprudence during the presence of the menstrual flow. It may be caused by bad uterine displacements, or result from traumatic influences. In the latter list may be placed the use of the uterine sound or sponge tent, which frequently gives rise to pelvic inflammation. Dr. Barnes says he has seen fatal peritonitis follow the simple application of nitrate of silver to the cervix uteri.

Bacteriological investigations have not developed any positive evidences of microbic causation in peritonitis, though several forms of micro-organisms have been found in the exudate.

Symptoms.—The characteristic symptoms of acute peritonitis are pain, tenderness, tympanites, vomiting and constipation. The attack is usually abrupt, being ushered in by a chill, followed by intense fever and very severe local pain and tenderness. Anomalies from this typical onset are by no means unusual. In septic cases due to a simultaneous and rapid infection of the whole membrane, the symptoms of shock and toxemia occur so rapidly that the sharp pain felt at the first moment is practically the only preceding symptom. In cases where a general suppurative peritonitis succeeds a localized abscess, the onset may be so insidious as to defy detection. The pain is of a burning or lancinating character, and may, from the start, be distributed over the entire abdomen, or, at first, be circumscribed, and extend gradually. The slightest touch, deep inspirations, and the act of coughing cause intense exacerbation; at times the pain assumes the character of spasm or colic. Usually the patient lies on his back, if the peritonitis is general, with the thighs flexed on the pelvis, and the shoulders elevated, in order to prevent pressure of the muscles on the tender peritoneum, through this decubitus is by no means constant. The respiration becomes superficial and rapid, to avoid motion of the diaphragm; in other words, the breathing is costal. Every cough and every full respiratory movement is most anxiously avoided, and every motion of the body causes severe pain. The greatest pain is usually below the umbilicus, but if the peritonitis be due to perforation, the location of the pain will correspond to the point of attack. If referred to the epigastrium and radiating to the back or shoulders, we would sus-

pect gastric ulcer, or, if in the ileo-cecal region it would indicate appendicular abscess. The countenance soon becomes hippocratic and collapse symptoms supervene. The symptoms of collapse, according to Bauer, are generally connected with the quantity of the effusion and the severity of the vomiting, which is rarely absent. This usually sets in early, the articles vomited being first food and gastric mucus, and then biliary matters from the duodenum, and, later, feculent matter, owing to occlusion of the intestines. The abdomen soon becomes distended and tense, generally in a great degree, and remains so during the course of the disease. This distention is first due to the presence of gas in the intestines, the subsequent extreme tympanites being supposed to result from paresis of the muscular fiber of the bowel, allowing an expansion of the contained gases, and at the same time retarding their escape. The tympanitic percussion sound is obtained most over the course of the colon, and over the abdomen in general, except in the most dependent parts where the collection of ascitic fluid gives rise to dullness varying with the changes of position of the patient. The distention of the abdomen presses upward, encroaching upon the diaphragm, and compresses the lungs, giving rise to most distressing symptoms of dyspnea and rapid respiration, while the disturbance of the circulation thus caused may give rise to cyanotic symptoms. Obstinate constipation is usually present, arising from paralysis of the muscular coat of the intestines. At the same time, paralysis of the sphincter is sometimes present, allowing the escape of fecal matters by mere pressure upon the abdomen.

Painful urination is present; the desire to urinate is frequent, and the quantity of urine passed is very small. Complete retention may occur. In many cases there is a distressing hiccough, the tongue is generally coated, and there is a complete loss of appetite, and great thirst. The temperature is usually raised, and runs an irregular course, bearing no direct relation to the severity of the disease. As a rule, a high temperature indicates an extensive peritonitis, but a low temperature does not necessarily indicate a mild attack. The fever may rise to 102° or 104° F, but in some cases there occurs a sudden fall in the temperature with the appearance of collapse symptoms, indicating the intervention of an acute peritoneal sepsis. Death soon occurs in these cases, and the temperature may be high again at the time of the fatal issue. A steady rise in temperature usually indicates a spreading peritonitis. In some cases with encapsulated collections of pus, the temperature may become markedly remittent. The pulse is rapid and "wiry," being more rapid than can be accounted for by the fever. "As a rule, the pulse gives reliable information as to the general

condition of the patient." The rectal temperature is often relatively high. On approaching collapse, the pulse rises to from 160 to 200, but the temperature falls below normal. The expression of the countenance is that of extreme anxiety and distress. Sometimes the upper lip is elevated and drawn tight over the teeth, as is seen in no other disease. The intellect generally remains clear, but finally becomes clouded, the patient growing apathetic and delirious toward the close of the disease.

In *adynamic peritonitis* the temperature, except in the rectum, is subnormal, the pulse feeble and rapid, and signs of collapse evident from the onset. In partial peritonitis the symptoms of a primary disease from which the former extends, may precede the peritoneal symptoms, though often the primary disease remains latent until the peritoneal inflammation is developed. The symptoms are first those of general peritonitis, but they rapidly become localized. The pain and the degree of tenderness often depend largely on the extent and rapidity of the inflammation, which is oftener subacute than acute in its character.

Some of the symptoms of general peritonitis may be entirely absent, as is notably the case with the vomiting and tympanites, which, if present at all, are only so in a comparatively mild degree. In mild cases the symptoms may rapidly disappear and the patient entirely recover. More often, however, the local symptoms, though apparently subsiding, remain, and percussion over the spot gradually becomes duller, the resistance of the abdominal walls more decided, and a more or less defined tumor makes its appearance, which suppurates, and may discharge externally, or follow the course of a capsulated abscess in general peritonitis. This condition more often follows the partial peritonitis consequent upon an inflammation and ulceration of the cecum and vermiform process.

Pelvic peritonitis presents some symptoms peculiar to itself. An attack may be preceded for several days by pelvic uneasiness and weight, but quite as often it is ushered in with the chill, fever and pain characteristic of the other varieties. The pulse and temperature are variable, sometimes being nearly normal and at other times very high, and sometimes fluctuating between the two conditions. The symptoms of local tenderness, tympanites, vesical irritation, nausea, etc., do not essentially differ from those occurring in other varieties of partial tympanites.

Infantile peritonitis rarely occurs idiopathically, and when it does, or when it follows exanthematous diseases, or occurs during an epidemic of puerperal fever, it presents but few features essentially different from

peritonitis in adults. The skin usually presents a dirty-yellow color, and in the last stage becomes cyanotic and icteric. Vomiting occurs with less uniformity than in adults, but the child refuses the nurse from the beginning, as the act of sucking increases the pain in the abdomen. A watery diarrhea is present instead of the constipation which is found in adults. The disease may run a very rapid course, and terminate fatally in 24 or 48 hours, though in older children it may continue for several days, and occasionally, though seldom, assume a rather chronic course.

In *ante-natal peritonitis* the symptoms are too indefinite to be reliable, especially if death occurs before birth. Sometimes the child is born with an intensely distended and painful abdomen, with edema of the lower limbs, and with jaundice, thus suggesting at once a diseased peritoneum. Such cases nearly always die within a few hours or, at most, days.

Puerperal peritonitis offers some peculiarities distinct from those varieties which occur independent of the puerperal state. The symptoms usually appear within five days after confinement, though in exceptional cases the interval may be much longer. The patient first complains of pain, and experiences a chilliness, which soon gives place to hot skin, quick pulse and rapid respiration. The pain is characteristic, and resembles the pain of general peritonitis, but neither pain nor tenderness is uniformly present. The abdomen enlarges and becomes tympanitic much more rapidly than in general peritonitis, probably on account of the recent and prolonged distention of the uterus and abdominal walls, and their present relaxed condition. The lochia are diminished in quantity, or entirely suppressed. The secretion of milk does not take place, or if it has already done so, it is suppressed, and the mammæ become small and flaccid. Otherwise the symptoms and course of this form do not vary essentially from those of general peritonitis.

The course of acute peritonitis is rapid, and the mortality very great. If, as sometimes occurs, the malady takes a favorable course, the pain, tympanitis and fever generally subside, the respiration becomes freer, and the patient may recover rapidly, though often adhesions remain which may produce habitual constipation for life. If peritonitis arises from perforation, death may be expected within two or three days. In idiopathic peritonitis death occurs usually in the course of five or six days, but may be delayed until the middle of the second week. Occasionally death occurs quite suddenly, probably owing to cardiac exhaustion or paralysis. In case death does not occur within this time, nor improvement set in, the disease usually assumes a chronic

form. If recovery should take place, the inevitable result, according to all old school authorities, is the formation of adhesions and fibrous bands, the contraction of which may cause constriction of the bowels, bile ducts and other structures. It is generally believed that these sequelæ are much less apt to occur under homœopathic treatment.

Diagnosis.—In a typical case of acute peritonitis the mode of onset, the great pain and excessive tenderness on pressure, together with the tympanitis, the posture of the patient, the vomiting, and, often, the symptoms of pyemia and collapse, will usually serve to differentiate it from other inflammatory or hysterical affections. Asthenic cases are often difficult of diagnosis, especially in an advanced stage. In all such, an exact history of the case prior to and during the onset and development of the symptoms is of great importance, in order that if possible, a definite idea may be obtained as to the cause and point of origin. *Acute catarrhal enteritis* is less intense in all its manifestations. *Colic* lacks the continuous pain, tympanitis, high temperature and pulse, and muscular rigidity of peritonitis. In *rheumatism* of the abdominal muscles there will usually be evidence of rheumatism in some other part of the system; the pain is limited to the muscles, deep pressure does not increase it, and the constitutional symptoms do not indicate a severe disease. *Neuralgic* conditions of the abdomen, occurring in hysterical women, and complicated with hyperesthesia of the skin, often simulate peritonitis. Frequently, in such cases, there is more or less tympanitis, and the patient may assume the dorsal decubitus with the thighs and knees flexed; but there is usually present the ordinary hysterical history, an absence of fever and of muscular rigidity, and firm, deep pressure is well borne, and may even afford relief, while light pressure is unbearable. In the *passage of gall stones* there is usually great sensitiveness in the right hypochondrium, but the pain is paroxysmal, and there is an absence of tympanitis and of the constitutional symptoms of peritonitis, and, moreover, *all* trouble ceases as soon as the stone has passed. The differential diagnostic points between acute general peritonitis and acute intestinal obstruction are given in the article on the latter subject.

Partial peritonitis, being generally connected with an affection of the parts covered by the inflamed portion of the membrane, is usually readily distinguished. If the inflammation is situated over the liver or spleen, we may hear a friction sound. The presence of lymph causing roughness of the opposing surfaces. In such cases we usually get the costal respiration, so characteristic of general peritonitis. Pelvic peritonitis may be confounded with pelvic

cellulitis. It must be remembered that the latter will probably only occur after parturition, abortion, or an operation on the pelvic viscera, while peritonitis results from an entirely different class of causes. If the inflammation results from the extension of gonorrheal disease, it is safe to locate it in the cellular tissue rather than in the peritoneum. Pelvic hematocele is more sudden in its onset, and is chiefly characterized by the symptoms of great loss of blood with which there are no inflammatory signs. The tumor rapidly assumes a larger size than any enlargement connected with peritonitis, and is at first soft, gradually becoming hard. Hematocele may excite peritoneal inflammation, after which a diagnosis is more difficult. Thomas holds that fecal impaction is a frequent complication of pelvic peritonitis, and, often remaining after the inflammation has passed away, gives rise to the belief that the latter is still present. I am confident, however, that this is seldom the case when opium has not been freely used to relieve the pain consequent upon the peritonitis.

Prognosis.—Acute general peritonitis is at best a grave malady, and the prognosis should always be guarded. Cases which arise from the extension of simple inflammation of the abdominal and pelvic viscera by contiguity of tissue, or cases of traumatic origin, offer the most favorable prognosis, while, on the other hand, the gravest cases are those of general suppurative peritonitis and those which are associated with pyemia, including puerperal peritonitis. The next gravest in character is perforative peritonitis, and I question if it should not be ranked as the most uniformly fatal, though recovery is not impossible, provided the opening be small, and closure be quickly effected by the exudation of lymph and the formation of adhesions around it.

Death in fatal cases usually occurs in five or six days. Unfavorable symptoms are: Rapid, weak and intermittent pulse, increasing prostration, hurried and more shallow respiration, hiccough, cool and clammy surface, and cold legs and feet. On the other hand, favorable symptoms are: a remission of the pain and tenderness, diminution of the tympanitis and muscular rigidity, with a gradual return to the normal of the pulse, respiration and temperature. At best convalescence is slow, often extremely so, considerable tenderness remaining, and paroxysms of colicky pains occurring frequently for some time.

The prognosis in *partial peritonitis* is so entirely dependent upon the nature and extent of the disease with which it is associated, that while generally we may expect a favorable issue, this is not by any means an invariable rule. Of course, when there is a purulent collection which does not discharge externally, bad results may be anticipated.

Treatment.—Patients should be kept in a well-ventilated apartment, with a uniform temperature of 65° to 70° F. They should lie on a soft mattress, feather-beds being entirely proscribed. The coverings should be light, and frequently it may be found necessary to keep the covers from coming in contact with the abdomen by means of barrel-hoops or some other suitable contrivance. For the violent thirst, small draughts or sips of fresh water or small lumps of ice may be allowed. The diet should be exclusively of milk or malted milk, the former being peptonized or pancreatized. It should be given regularly every two hours, from four to six ounces at a time. If the stomach will not retain food, recourse should be had to rectal alimentation. If the stomach bears the milk well, other predigested foods may be cautiously allowed. I have used beef-peptonoids and Valentine's meat juice with most satisfactory results. When convalescence begins, the diet should be of mild, unstimulating character, solid food being avoided on account of the bulky fecal residuum. Soups, especially beef broth, are desirable; also arrow-root, tapioca, and other farinaceous articles, which, unless there is much exhaustion, should precede the animal broths. After a time lean meat may be allowed, but it should be used cautiously, as should also fruits and vegetables, which tend to produce flatulence. If at any time the patient shows signs of rapid exhaustion, resort should be had at once to the use of stimulants, small quantities of good wine or brandy and water being most desirable.

The application of hot fomentations over the abdomen, or of hot poultices, made from corn or linseed meal, is of great importance. Poultices will retain the heat for a long time, but must be made very thin, and should be covered with cotton. Many physicians contend that in the first stage ice or ice-cold applications should be used, warm applications being useful only after the fourth or fifth day. Heat is of greater service in lessening the pain than cold, and is a more desirable method of treatment in all respects. Perhaps in the incipency of a localized peritonitis the ice-bag may prove most beneficial. For the relief of tympanitis, turpentine stupes are universally used by the old school and by many homœopaths. I have seen cases where cystitis with bloody urine has resulted from their use. Turpentine is certainly homœopathic to tympanites. I think one drachm of turpentine to an ounce of melted lard, or olive oil, is sufficient. It may be applied by saturating a linen cloth of sufficient size, and placing it over the distended abdomen beneath the poultice. Sometimes the passage of a rectal tube will relieve the tympanites for a short time. Hot rectal enemas are often beneficial. Fitz recommends the frequent puncture of the distended bowel with a small hollow needle in extreme cases of meteorism,

stating that the danger of extravasation, or of the escape of gas into the peritoneal cavity is comparatively slight. This method should only be employed as a last resort. Constipation is not harmful in peritonitis, and should be let alone. Vomiting is best controlled by carbonated waters or iced champagne given in small quantities. The use of opium and cathartics, as universally employed by the old school, should be persistently avoided as unjustifiable and positively injurious. Cases may occur in which the suffering is so intense and remedies failing to give relief, the physician is justified in administering hypodermic injections of morphine. This is a necessity greatly to be regretted, as the use of opium in any form masks the symptoms, and interferes with the action of homœopathic remedies. It is now the custom in all cases of peritonitis with urgent symptoms to resort early to surgical treatment. Perhaps this is best in septic cases, though even in such cases our remedies are not altogether impotent, neither are surgical measures altogether successful. On the contrary, about four fifths of those operated upon die. Acute circumscribed peritonitis calls for surgical treatment to open and drain the abscess. The operation may be deferred in many cases until the limiting adhesions have had time to become firm.

Therapeutics.—In typical cases there are four remedies of inestimable value, one or more of which are required in almost every case, namely *Aconite*, *Belladonna*, *Bryonia* and *Merc. cor.* Later in the disease and in asthenic cases, other remedies are of equal relative value.

Aconite (2x).—The action of Aconite upon serous membranes is well known, and its usefulness in the immediate first stage of acute peritonitis is only second to its wonderful virtues in the first stage of acute pleurisy. It is only of use, however, when the characteristic group of symptoms calling for it is present. Very rarely is it called for or of any benefit in septic or asthenic cases. It is especially indicated when the attack results from cold or exposure. The skin is hot and dry, the temperature high, the pulse hard, full, and frequent, and the respiration short and quick. The patient is extremely anxious and restless. The abdomen is swollen, burning hot, and sensitive to the touch. There is great thirst, much vomiting, the urine is scanty, scalding hot, and red or dark colored; after confinement the lochia and milk are suppressed, and there are sharp cutting pains, worse from pressure, or when lying on the right side.

Belladonna (2x) ranks next in importance. It is frequently indicated from the first, especially in suppurative peritonitis and in the puerperal variety. The pulse is full and strong; there is much throbbing of the carotid arteries; the face is flushed, and the eyes brilliant

and protruding, and there may be delirium. The abdomen is painfully distended, with much heat and burning; cutting, colicky pains, worse from the slightest motion or contact. This remedy is often indicated when there are complications with metritis or perityphlitis or any other localized inflammation. It is almost invariably indicated in the first stage of acute circumscribed peritonitis. After confinement, when the lochia are hot and offensive or suppressed, and violent after-pains occur, Belladonna is the chief remedy, often preventing peritoneal inflammation. Often indicated in pelvic peritonitis. In case Belladonna fails, Dr. Kafka recommends Atropine sulph. 6x.

Bryonia (2x) follows Aconite or Belladonna after the fever has relaxed, and effusion has taken place or is about to occur; it promotes absorption. My own experience is that if Aconite is indicated in the first stage, Bryonia is almost certain to be called for next, but that it is rarely indicated after Belladonna, or in cases where the effusion is purulent rather than serous. It is indicated by the stitching, lancinating pains in the bowels, worse from the slightest motion. There is great thirst for large quantities of water; the mouth, lips, and tongue are very dry; the tongue is thickly coated white; there is considerable nausea from motion, and obstinate constipation. It is especially useful when the diaphragm is involved in the inflammatory action.

Merc. cor. (3x). — This drug has a powerfully irritating effect upon the peritoneum, producing an intensely acute inflammation, rapidly tending to purulent and gangrenous disorganization. This fact has led to the very general use of the drug in violent cases regardless of individual indications, and no doubt it often proves of great service in a very grave class of cases. I look upon Merc. cor. as holding the same relation to Bell. that Bry. does to Aconite. It rarely follows Aconite, but is almost always the next remedy to be employed after Belladonna. This is simply from the fact that Aconite and Bryonia are indicated in serous effusions and Belladonna and Mercurius in cases where the exudate is purulent. The symptoms calling for Merc. cor. are: Creeping chills, surface cold, and covered with perspiration, which affords no relief; foul odor from the mouth; distended and painfully sensitive abdomen; mucous stools, with persistent tenesmus and violent burning and cutting pains; edematous swelling of the feet; great weakness and emaciation. Is especially useful in the various forms of partial peritonitis, with a tendency to the formation of abscesses. The late J. S. Mitchell gave Bell. and Merc. cor. in alternation in all cases of peritonitis, and with results that to him were quite satisfactory.

Sulphur (6x). — This remedy is complementary to and follows Bryonia or Mercurius well, hastening resolution and promoting the absorption of the exudate.

Veratrum album (3x) is indicated when there is much vomiting and diarrhea; violent colicky pains; coldness of the skin; cold sweat, especially on forehead; sunken features; small and weak pulse, and great restlessness, anxiety and exhaustion.

Arsenicum (3x) is of great value in septic cases and those of the asthenic type, or in which the exuded fluid is copious and persistent. There is a sudden sinking of strength; great restlessness and anxiety; hippocratic countenance; violent burning and cutting pains in the abdomen; constant thirst, drinking often, but little at a time; vomiting, and sometimes diarrhea. All symptoms are worse after midnight.

Lachesis (6). — This remedy is useful in the same class of cases as Arsenicum. Goodno says "when associated with a gangrenous focus, as in appendicitis, there is a tendency to rapid blood decomposition." The tendency to pus formation is much more characteristic than in Arsenicum. Nervous symptoms are present, but not the extreme restlessness and anguish of Arsenicum. There is a great sensitiveness of the abdomen to touch, even of the bed clothes, and aggravation after awakening from sleep is characteristic.

Rhus tox (3x). — Very useful in typhoid cases. In the later stages, where septic symptoms predominate, it having the power to prevent the absorption of septic materials. Consult symptoms under typhoid fever.

Cantharis (3x) may be called for in extreme cases, the tympanitis being great, violent burning and cutting pains in the abdomen, great prostration, and especially when the characteristic urinary symptoms are present. Also consult *Apis* (3x), *Baptisia* (1x), *Colch.* (2x), *Nitric acid* (3x), *Colocynth* (3x), *Chin. sulph.* (1x), *Hepar sulph.* (3x), *Phos.* (3x) and *Verat. vir.* (1x).

CHRONIC PERITONITIS.

Definition.—Chronic inflammation of the peritoneum.

Pathology.—The chief morbid change in chronic peritonitis is the thickening of the peritoneum by the proliferation of connective tissue. Firm, thick adhesions mat together opposing surfaces, the intestines adhering in globular shapeless masses. The adhesions may be general, or only formed in local bands, while between these an effusion takes place of a serous, purulent or bloody fluid. The peritoneum sometimes becomes from one fourth to one half an inch in thickness. Congested patches occur here and there, covered with recent deposits of fibrin. The omentum is sometimes rolled up into a sausage-shaped mass lying transversely across the abdomen. There is usually little serum, and the condition is therefore designated as "adhesive" or

“proliferative peritonitis,” but in some instances, apparently oftener in children, there is an ascitic exudation either over the whole surface or limited to irregular areas by encapsulating adhesions.

In some cases the peritoneum is covered in places by layers of membrane formed of new connective tissue, and which alternate with layers of hemorrhagic effusion. This form is known as chronic hemorrhagic peritonitis. Chronic localized peritonitis usually follows a localized acute peritonitis, the latter having resulted from an inflammation of an adjacent abdominal organ. It is usually found affecting the serous covering of the spleen, liver, or portions of the intestine, more particularly the appendix. Firm adhesions are established which mat together the peritonéum and the intestines.

A majority of chronic peritonitis cases are tuberculous in character and this variety is elsewhere described.

Etiology.—Chronic peritonitis may succeed a protracted course of acute peritonitis, or may be chronic from the start. In such it may result from chronic nephritis, rheumatism and chronic alcoholism. A large majority of cases occur in alcoholic patients.

Symptoms.—If chronic peritonitis appears without a previous acute attack, its approach is insidious and obscure, and often destitute of anything like characteristic symptoms, though pain in the abdomen is constant and annoying, but not severe or distressing. If chronic peritonitis succeed the acute variety, the symptoms of the latter are moderate, the pain, fever, and tympanites partially subside, but the effusion persists, dullness on percussion becomes more distinct, and an increasing resistance is observed over the dull spots. From this time on, the course of the disease is the same whether it be of primary or secondary origin.

Sacculations are formed with dense membranes, which cause considerable opposition to the absorption of the inclosed effusion, and which act as incentives to new inflammation in the intervening spaces. Thus we may have present at the same time the symptoms of existing effusion and its metamorphosis and those of pus inflammation. These sacculations may appear like irregular tumors, and give the abdomen a nodular and unsymmetrical appearance. If the omentum be rolled up, it may be felt as an irregular mass lying across the abdomen, and may be mistaken for the nodular edge of an enlarged liver. Sometimes the capsulated exudation becomes purulent, and gives rise to symptoms of abscess, together with chills, fever, sweat and other indications of septic poisoning. If there is a free serous effusion, the usual symptoms, physical signs peculiar to ascites, are present. Disturbances of digestion are present in nearly all cases of chronic peritonitis. Obstinate

constipation exists, sometimes alternating with diarrhea. Distortions and flexions of the bowels may cause obstruction, and the common duct may be compressed or twisted, giving rise to jaundice. The urine is passed in small quantities, which slowly increase if absorption of the fluid takes place. The patient gradually emaciates, the muscles become soft and flabby, the skin dry and scaly. Edema of the lower extremities sets in, and death from exhaustion occurs in the fifth or sixth week, though the course of the disease may be much slower, the patient living for months and even years, especially in the ascitic form. Sometimes ulceration and perforation of the peritoneum occurs, which is marked by a sudden increase of the temperature and pulse, and symptoms of an abscess pointing externally soon appear, or, in more fortunate cases, the abscesses perforate the intestine, and their contents are discharged per rectum. Such patients either make a very slow convalescence, or finally die from exhaustion. If reabsorption of the exudation takes place in chronic peritonitis, the convalescence is always very slow, and remaining adhesions leave various contractions and distortions of the pelvic viscera, which are usually the sources of lifelong and severe suffering.

Often peritonitis develops in children from no apparent cause. The ascites is often considerable, but the symptoms moderate, and recovery usually takes place.

Diagnosis.—Chronic peritonitis is often difficult of recognition, especially when not preceded by the acute form. It is most likely to be confounded with symptoms resulting from stasis of the portal vein, especially ascites; cirrhosis of the liver being the disease which it is most often necessary to exclude. In the latter, the jaundice, enlarged spleen, clay-like stools, dark-colored urine, and normal temperature and pulse, together with the diagnostic symptoms of ascites, will be sufficient to establish its presence. Simple chronic peritonitis can not always be distinguished from the tuberculous form. The latter is attended with fever, more pain and tenderness, there is a more rapid accumulation of the exudate, and debility and emaciation occur more rapidly.

Prognosis.—The prognosis of chronic peritonitis is, as a rule, unfavorable, though the disease may extend for months and even years before death results. According to Galvagni, the prognosis is more favorable when the effusion is serous, especially in children; less favorable in the fibrinous forms, and least favorable in the purulent.

Treatment.—The patient should be surrounded by proper hygienic influences, and the diet should be carefully chosen, the food being nourishing and easily digested. The coarser vegetables and

saccharine foods produce gas which aggravates the pain, and should, therefore, be prohibited. Gentle exercise, either by carriage or boat-riding, is often beneficial, though it must not be carried to the point of fatigue. When the patient can endure the removal, it is sometimes wise to give a change of air and scenery, by sending him to the seaside or some summer resort, or, even, if desired by the patient, by allowing an ocean voyage. When the ascitic accumulations are large, they should be withdrawn by puncture of the abdominal wall. Repeated tapplings are beneficial rather than harmful. Purulent collections should be evacuated and drained. Laparotomy must be resorted to, if medicinal treatment does not avail. The latter is purely symptomatic. The remedies most often required are *Apis* (3x), *Calc. carb.* (30x), *Calc. iod.* (2x), *Ars. iod.* (3x), *Aurum. mur.* (3x), *Kali iod.* (2x), *Silicea* (6x) and *Sulphur* (6x to 30x).

TUBERCULOSIS OF THE PERITONEUM.

The frequency of tubercular depositions in the peritoneum is only second to that of the same in the pulmonary structures and in the mesenteric glands. If only existing locally, in connection with tubercular ulceration of the intestines, occupying a space on the serous membrane corresponding to the diseased portion of the bowel, they may give rise to very little disturbance, and not be recognized during life. When, however, tubercles are developed on the serous surface without local cause, and from the condition of system which gives rise to similar deposits in other organs, they induce characteristic and important symptoms which are of the utmost clinical interest.

This condition is often described as tubercular peritonitis, owing to the local inflammation induced by the presence of the tubercles, and was formerly considered a variety of peritoneal inflammation.

Tuberculosis of the peritoneum may occur in all ages, but is decidedly more frequent in children over five years of age, and is almost invariably associated with tubercular deposits in other organs, to which it appears to be secondary.

Pathology.— Osler describes three forms as follows: —

“(1) *Acute miliary tuberculosis* with sero-fibrinous or bloody exudation.

“(2) *Chronic tuberculosis*, characterized by larger growths, which tend to caseate and ulcerate. It may lead to perforation of the intestinal coils. The exudate is purulent or sero-purulent, and is often sacculated.

“(3) *Chronic fibroid tuberculosis*, which may be subacute from the onset, or which may represent the final stage of an acute miliary

eruption. The tubercles are hard and pigmented. There is little or no exudation, and the serous surfaces are matted together by adhesions."

Symptoms.—The characteristic symptoms of peritoneal tubercles are mainly attributable to the inflammatory condition. These are modified and often overshadowed by the symptoms of constitutional tuberculosis, affecting different portions of the body, some of these local lesions preceding the tubercular manifestation in the peritoneum. Thus it occurs that the symptoms and course of tubercular disease of the peritoneum vary greatly in individual cases, it being almost impossible to establish any definite aspect by which the local character of the affection may be readily recognized. Some cases develop abruptly with more decidedly acute symptoms, rapidly followed by fluid effusions, and general constitutional disturbance, the disease gradually assuming a chronic form. In other cases anemia, emaciation and marked typhoid symptoms soon supervene. There is usually some ascites, which is occasionally hemorrhagic. Tympanites due to intestinal paresis is often present in these cases. In the fibroid variety without effusion, the abdomen is distended, there is pain with tenderness on pressure, and a characteristic tumor mass lying across the upper part of the abdomen, due to a thickened and rolled-up omentum. When a limited exudate is present, it may become encysted by adhesions, producing a localized tumor. This may occur in any portion of the abdomen, oftener in the middle, and the sacculations may be so small as to be unrecognizable, or so large as to occupy the entire anterior portion of the peritoneum. Irregular tumor-like masses may also result from tubercular mesenteric glands, especially in children, and from retracted and thickened intestinal coils.

Diagnosis.—Unless tuberculosis of other organs is present, a diagnosis is often impossible. If it is possible to exclude the presence of tuberculosis of the lungs, heart or kidneys, we may then not be certain as to the presence of cirrhosis of the liver, which, in many respects, is quite identical in its symptomatology with tubercles of the peritoneum. This latter disease, however, usually occurs in persons who have been addicted to strong drink, the tubercular dyscrasia is also absent, the abdomen is less painful and less sensitive to pressure, the spleen may be enlarged, the pulse and temperature not affected, at least not continuously; there is less vomiting, emaciation is not so marked, and there is often a collateral dilatation of the veins, which does not occur with peritoneal tubercles. From carcinoma of the peritoneum, or of other organs, we may usually

distinguish tubercles of the peritoneum by the absence of the cancerous cachexia and by the local manifestations of a cancerous growth ordinarily present in such cases. The differential diagnosis from chronic peritonitis usually depends upon the presence of the constitutional symptoms of tuberculosis, but since simple chronic peritonitis may occur in tubercular individuals, it lessens the certainty of the diagnosis. In tubercular peritonitis, the aspirator or exploring needle will show more or less hemorrhagic admixture in the effusion, a symptom not obtained in the simple variety. Finally, it should be remembered that nearly all cases of chronic peritonitis are tuberculous.

Prognosis.—The prognosis is unfavorable in the degree in which it is unfavorable in other tubercular diseases, largely depending upon the extent of the constitutional dyscrasia and upon existing complications. Bauer regards the prognosis as “absolutely fatal.”

Treatment.—A nourishing *diet* of easily digested food, calculated to sustain the strength of the patient as far as possible, is very important. The patient should be much in the open air, and take such gentle exercise as his condition will permit, which is usually confined to carriage and boat riding. Altogether, such dietetic and hygienic rules should be observed as have been found useful in the treatment of other forms of tubercular disease.

Surgical treatment is becoming quite popular. In some cases it has no doubt proved successful. It is claimed that in chronic tubercular peritonitis from seventy to eighty per cent have been saved. In some cases merely an exploratory laparotomy in which the abdomen has been opened, inspected, and sewed up again at once, has been productive of good results. I know from experience that much may be accomplished by the administration of remedies homœopathic to the condition and to the individual case.

Therapeutics.—**Calcarea carb.** (6x to 30x) is the most important remedy. It is indicated in leucophlegmatic persons, especially in children who have a distended abdomen, and whose mesenteric glands are hard and swollen.

Calcarea phos. (6x) is indicated when the nutrition is especially defective. The child is emaciated and constantly hungry; eating does not satisfy, but always produces more or less distress in the stomach. Frequently the osseous system is characteristically affected. There is a tardy closing of the fontanelles; the skull bones are soft and thin, there is a great muscular weakness, with inability to walk or hold the head up, and curvature of the spine.

Silicea (6x).—Especially useful in imperfectly nourished children

with large abdomen, weak ankles, and profuse sweat about the head, the rest of the body being dry. The fontanelles remain open, the head is large, and the body emaciated; the abdomen swollen and hot. The child is very weak and always cold. Diarrhea is usually present, the stools being very offensive.

Sulphur (30x).—In scrofulous children, and especially when resulting from a suppressed eruption. There is extreme emaciation and great weakness, with deficient reactive power.

Phosphorus (6x).—When there is complication with pulmonary tuberculosis, there is considerable tympanites, with sensation of weakness and emptiness in the abdomen, painless debilitating diarrhea of undigested food, and hectic fever. Also consult *Arsenic* (30x), *Arsen. iod.* (3x), *Calcarea iod.* (3x), *Carbo veg.* (30x), *Iodine* (3x to 30x).

ASCITES.

Synonyms.—Hydro-peritoneum, Dropsy of the Peritoneum. Abdominal Dropsy.

Definition.—An accumulation of serous fluid within the peritoneal cavity.

Pathology.—The quantity of the effusion which may exist in ascites varies from a few ounces to many gallons. It is usually of a pale, straw color or possibly of a greenish tint, and is generally clear and transparent, and may be free from flocculi or any foreign constituents. Its reaction is alkaline, and its specific gravity between 1010 and 1015. In cases due to carcinoma of the liver the specific gravity may be as high as 1023.

It contains albumen, but the proportion is less than is present in the blood serum, but greater than other serous exudation except hydrothorax. The biliary acids and pigment are also found in the ascitic fluid, when jaundice exists, and creatine and creatinine are very common constituents. In many cases fibrin is held in solution, and slowly coagulates in an exceedingly fine reticulation of fibers. Sometimes ascitic fluid is reddish from the presence of blood derived from ruptured capillaries; again, blood may indicate the probability of cancer. The peritoneum long in contact with fluid is altered in character and appearance by imbibition; it becomes sodden, cloudy and thickened, but these are not inflammatory changes. In some cases the fluid presents a milky appearance, due to the presence of molecular fat. Such cases are designated as chylous ascites.

“This condition may be associated with a collection of milky

fluid in the left pleural sac when there is thrombosis of the subclavian vein at the point at which the thoracic duct enters. The term *ascites adiposus* is applied to a milky fluid in the peritoneal sac which shows the presence of large and small fat globules to the exclusion of other morphologic elements." (Anders.)

Etiology.—An ascitic exudate is common to all forms of peritonitis, but by the term ascites is understood a serous transudation resulting from stasis in the branches of the portal vein, without inflammatory changes. Those conditions which prevent the return of venous blood from the peritoneum, and which are, therefore, causes of ascites, are: Obstruction of the portal vein, either in the terminal branches within the liver, as in cirrhosis of the liver, or in a larger trunk without the liver, as from thrombus formation, from external pressure by proliferative peritonitis, new growths, or abdominal aneurysms; general venous congestion arising in the course of chronic heart disease, emphysema, or intestinal pneumonia; hydremic blood conditions, as in Bright's disease or in advanced anemia. Chylous ascites is due to injury to the thoracic duct by perforation, rupture, or by the *filaria sanguinis hominis*, or to its thrombosis or obliteration. In adipose ascites the fat originates from the fatty degeneration of cells, usually the product of a cancerous or tubercular peritonitis.

Symptoms.—Ascites affords no subjective symptoms save such as result from the mechanical weight and pressure of the accumulated fluid. It follows, therefore, that when the effusion is slight, there are no symptoms. The chief physical sign of ascites is a gradual uniform enlargement of the abdomen. The fluid seeks the most dependent portions of the peritoneal cavity, and changes with the posture of the patient. If the patient is erect, the fluid distends the iliac and hypogastric regions; if lying down, the fluid flows to the sides; if turned upon one side, the fluid takes a corresponding position. If the fluid does not thus move freely, but changes its position slowly and incompletely, or remains immovable, inflammatory exudation is indicated. The physical signs are usually characteristic. Measurement shows the increased circumference; palpation reveals a peculiar wave impulse from one side of the abdomen to the other, obtained by placing one hand over one flank and lightly tapping with the other hand the opposite flank; percussion gives a tympanitic note over the intestines and dullness over the fluid, the relative areas of these percussion sounds changing with the position of the patient. "Small amounts of fluid, probably under a quart, would scarcely give movable dullness, as the pelvis and the renal regions hold a considerable quantity. In such cases it is best to place the patient in the knee-elbow position, when a dull note will be deter-

mined at the most dependent portion." (Osler.) Often there is secondary edema of the lower extremities and the scrotum from pressure upon the vena cava and iliac veins. The urinary secretion is diminished because of the pressure on the renal arteries and veins, and of the escape of fluid into the peritoneal cavity; constipation results from the compression of the sigmoid flexure. In cases resulting from heart or lung diseases, or from hydremic blood states, the ascites is only a part of a general dropsy with edema of the lower extremities, and usually hydrothorax.

Diagnosis.—Ascites is most often mistaken for an ovarian cyst. Anders gives the following differential table :—

Ascites.	Ovarian Cyst
CLINICAL HISTORY.	
General health is bad prior to the appearance of the enlargement.	General health is good before the development of the tumor; failure of health afterward.
History of disease of liver, lungs, heart, kidneys or other organ.	Frequent history of dysmenorrhea, negative as to organic affections.
Swelling begins below and gradually extends higher; more noticeable when sitting than in the standing posture.	Swelling is unilateral at first, gradually becoming more central.
PHYSICAL SIGNS.	
Enlargement is symmetric, the abdomen being rounded and most prominent about the umbilicus; in the supine posture the abdomen flattens, with lateral bulging; the umbilicus is often pouched and thin.	Enlargement is asymmetric or irregular, unless the tumor be very large, when it may fill the entire abdomen. The greatest circumference is below the umbilicus, which never bulges.
Fluctuation is general from side to side, and in a vertical direction.	Fluctuation is circumscribed, corresponding to the limits of the tumor.
No aortic pulsation felt.	Aortic pulsation is sometimes evident.
Vaginal examination often shows the uterus to be movable. A pouch may project into the vagina, but no cyst is detectable.	Vaginal examination shows the uterus to be displaced. A cyst may be felt and outlined in the pelvis.
When standing, the upper line of dullness is concave.	When standing, the upper line of dullness is uniform or convex.
In the supine position the flanks are especially dull, with tympany in front.	In the supine position dullness is still in front, and the flanks are resonant.
Dullness is movable according as the position is altered.	The area of dullness is not varied by change of posture.

CHARACTER OF THE FLUID.

Ascitic fluid has a specific gravity of 1010-1014, and is usually clear. It is of a pale straw color.

Ovarian fluid has a specific gravity of 1018-1054. It is of a thick, turbid character, and the color is variable.

The same author also furnishes the following points of differentiation between ascites and chronic peritonitis:—

Ascites.

A previous history of organic disease of the liver, heart, kidneys, or other organ is obtainable.

No pain is experienced.

The abdomen is symmetrically enlarged.

Fluctuation is general in the transverse or vertical directions.

Palpation detects no hard masses of irregular prominence.

Dullness is always movable upon altering the position of the patient.

The fluid consists of serum with few morphologic elements. It is limpid, with a specific gravity of 1010-1014, and is pale straw-yellow in color, often with a greenish tinge.

Chronic Peritonitis.

There is a previous history of acute peritonitis, tuberculosis, or inflammatory diseases of the female pelvic organs; sometimes a history of injury.

Pain is a prominent symptom.

Abdomen is irregularly prominent, and rarely flat.

Fluctuation is often limited to circumscribed areas due to loculation of fluid.

Palpation often detects resistant, uneven prominences.

Dullness often not changeable on varying the position, owing to adhesions.

The fluid is either sero-fibrinous, sero-purulent, or milky in nature. It is often viscid, and its specific gravity is 1018-1024. The color varies.

A distended bladder sometimes simulates ascites, but all doubt is removed by using the catheter, which should be done in all cases before tapping for ascites. Large pancreatic or hydatid cysts in the abdomen may simulate ascites to some extent, but usually a differential diagnosis is easily established.

Prognosis.—Both the question of duration and that of recovery depends largely upon the nature of the cause producing the ascites. In ascites not associated with grave organic changes, the accumulation of fluid usually takes place rapidly and a restoration to health may occur within a few weeks. Other cases last longer. When dependent on obstructive disease of the heart, lungs, or liver, especially the liver, the duration is indefinite. When due to cardiac, pulmonary or hepatic disease, the prognosis is unfavorable. Such cases sometimes last for years.

Treatment.—Both the "dry diet" and a fluid diet are recommended. Dry diet consists in absolute disuse of fluids of every kind, and the use of water-free food. If on the contrary a fluid diet is

resorted to, skimmed milk is recommended as the best of all diluents. I am of the opinion, however, that neither the dry nor the fluid diet is of any consequence or material benefit. The patient should receive a light, nourishing diet, made up chiefly of nitrogenous food.

The use of purgatives, diuretics and diaphoretics accomplish very little, and may prove harmful. The causative condition may give rise to subjective symptoms, for which the indicated remedy must be prescribed. For the ascites the following are the chief remedies:—

Apocynum can.—Hale designates this drug as the “vegetable trochar.” It has the greatest reputation of all remedies in dropsy, whether idiopathic or secondary, but especially when dependent upon disease of the liver or kidneys. It may be given in fifteen to twenty-drop doses of the tincture or in an effusion. Sometimes nausea is produced, and if so, the drug should be given per rectum.

Digitalis.—This drug is especially useful in cases dependent upon heart disease. Its most important symptoms being a great anxiety and oppression, dyspnea, sudden sensation as if the heart stood still, pulse feeble, irregular, fluttering, intermittent, or extremely slow; any motion, especially rising from a bed or chair, causes the pulse to become rapid, weak and jerky, sometimes cyanosis and even syncope. This drug may be given in the tincture, but an effusion seems to answer a better purpose in ascites.

Arsenicum (3x).—This remedy is more often useful when the ascites is only part of a general dropsy, or when the condition results from an enlarged or cirrhotic liver, or from cardiac or renal disease. Pale, earthy or sallow countenance; great debility, with faintness on the slightest motion; great thirst, but drinks but little; sensation of burning heat all through the body, while the skin is cool; all pains burning; urine scanty, high-colored.

Jaborandi.—This drug produces copious perspiration and rapidly withdraws the water from the blood, and causes active reabsorption of the effusion. It is particularly useful in ascites resulting from cardiac or renal disease. It is only used in five-grain doses of the powdered leaves or in the tincture.

Cinchona (2x).—Ascites due to enlargement of the liver or spleen, especially from malarial poisoning. Also from functional disturbances of the liver or from anemia. There is great anemia and debility, diarrhea and fermentation, after eating.

Apis (3x).—This is one of our most important remedies, the keynote for its use being edema. It is especially indicated when there is general dropsy, and local edema of the eyelids is present. The skin appears whitish and waxy, transparent, and there is an absence of

thirst and scanty urination. Mostly in cases arising from kidney disease, the urine being highly albuminous and containing tube-casts. Also consult *Acet. ac.* (1x), *Aurum* (6x), *Bryon.* (3x), *Elat.* (2x), *Helleb.* (3x), *Lycop.* (6x), *Iodine* (2x), and *Ferrum* (3x).

If medicinal treatment fails, the embarrassed respiration and cardiac action will call for *tapping*, which may be done with the trochar, or, better still, the aspirator. The tapping does not remove the cause, and the fluid often rapidly accumulates again, when this proceeding should be repeated. Before tapping always examine the bladder, using the catheter if there be any doubt. In cases due to cirrhosis of the liver, Roberts recommends repeated tapplings "as a systematic method of treatment." Syncope sometimes results from the sudden removal of the fluid. This can usually be avoided by the application of a bandage during the operation, arranged so as uniformly to compress the abdomen. Permanent drainage by the use of Southey's tubes has given good results.

CARCINOMA OF THE PERITONEUM.

Pathology and Etiology.—Primary carcinoma of the peritoneum is a rare disease. Secondary growths occur in connection with carcinoma of any of the pelvic viscera. All the usual varieties are found—scirrhous, encephaloid and colloid. The latter sometimes occurs primarily, forming large-sized growths. It also frequently involves the omentum. The peritoneum is studded with carcinomatous nodules (except in colloid cancer) varying in size from that of a millet seed to quite a large size, and may be discrete or confluent. Usually the peritoneum is inflamed, thickened, and the omentum rolled up as in tuberculous peritonitis, and the peritoneal cavity contains a serous, hemorrhagic, milky or sometimes purulent effusion. The retro-peritoneal mesenteric and inguinal glands are usually involved. The disease occurs in advanced life, and is more common in women than men, the ovaries being a very common starting point of the malignant disease.

Symptoms and Diagnosis.—The symptoms of chronic peritonitis, with cachexia and progressive emaciation, are present, and in many cases ascites. There is nearly always some fever, and the pain and tenderness are usually more marked than in chronic peritonitis. In some cases pain is entirely absent. Physical examination reveals the usual appearances of ascites if there be much effusion, and this may be so great as successfully to obscure a tumor of large size, as sometimes occurs with colloid growths. In such cases a diagnosis from chronic peritonitis is often impossible. Even if the cancerous nodules are felt on palpation, they may be mistaken for the encapsulated exudate of a

chronic tubercular peritonitis. It must be remembered, however, that the latter disease usually occurs in children, while malignant peritoneal disease only occurs in advanced life. In tubercular peritonitis, there is no axillary involvement, which is nearly always present in any form of cancer of the abdomen. Secondary nodules about the navel are most common in carcinoma.

The *prognosis* is unfavorable. Primary growths may run a course of two or three years, but secondary carcinoma of the peritoneum usually proves fatal in a few months.

Treatment.—There is little to be done except to give the patient relief by administering opiates, and to aspirate the fluid when it becomes necessary. Homœopathic remedies may be prescribed from time to time for any subjective symptoms that may arise, but at best even these are only palliative, giving relief by removing associated functional disturbances.

SECTION II.

DISEASES OF THE RESPIRATORY SYSTEM.

I. DISEASES OF THE NOSE.

ACUTE RHINITIS.

Synonyms.—Acute Coryza, Acute Nasal Catarrh.

Definition.—Acute rhinitis, familiarly known as “cold in the head,” consists in an acute catarrhal inflammation of the nasal mucous membrane.

Pathology.—The mucous membrane, especially over the turbinated bones, becomes intensely congested, red and swollen, giving the latter a hypertrophied appearance, and causing more or less obstruction in the nasal passages. In the first stage there is usually no secretion, but later a watery, excoriating discharge takes place, which gradually becomes muco-purulent in character, and finally thick and pus-like, the whole process lasting from six to twelve days.

Etiology.—The most frequent cause of acute coryza is exposure to draughts of cold and damp air, especially when the body is overheated, and to the influence of repeated and rapid atmospheric changes, such as are of frequent occurrence during the spring and early winter months, the latter often producing the disease in epidemic form. Acute coryza may be excited by the inhalation of irritating vapors or dust. It occurs secondarily at the onset of certain infectious diseases, especially measles and influenza. There is no evidence that simple acute coryza is due to the action of micro-organisms.

Symptoms.—An attack of acute rhinitis is ushered in with chilliness, *malaise*, fullness in the head and sneezing. In severe cases there is pain in the back and limbs. A slight fever is present in most cases with the usually associated symptoms. The nasal passages are obstructed, necessitating mouth breathing, and both smell and taste are deficient or entirely absent. Soon a watery, acrid discharge takes place from the anterior nares, which corrodes the nose and lips, and produces abrasions, and at the same time there is profuse lachrymation. Later

the discharge becomes muco-purulent in character. Often the inflammation extends to, and involves, adjacent mucous surfaces giving rise to conjunctivitis, catarrhal pharyngitis, laryngitis, catarrh of the Eustachian tube and middle ear resulting in temporary deafness, and, in severe cases, bronchitis.

Diagnosis.—There is no difficulty in diagnosis save the danger of confounding simple acute coryza with that present at the onset of certain acute infectious diseases, especially measles and influenza. If the case be one of measles the presence of the epidemic will arouse suspicion, but often the diagnosis can not be made with certainty until the eruption makes its appearance. In influenza the temperature runs higher, the pain is greater and there is great prostration.

Prognosis.—Aside from possible extensions of the disease to adjacent organs the prognosis is entirely favorable, the attack rarely lasting longer than from five to ten days.

Treatment.—In severe cases the patient should remain in bed. In all cases continual warmth is required and exposure to outside atmosphere must be avoided. While I do not consider local remedies as curative, they often prove soothing to the irritable membranes, and give the patient comfort. For this purpose I sometimes use benzoinol with five per cent each of menthol and pine needle oil. The compound tincture of benzoin, two drachms to a pint of water, makes a satisfactory inhalant. The preparation should be heated nearly to boiling and the vapor inhaled occasionally for five or ten minutes at a time. Cocain should not be used under any circumstances. A watery extract of hamamelis diluted and used as a douche is often beneficial. Hot fomentations applied over the forehead and eyes often give great relief, especially when there is a severe frontal headache from blocking of the sinuses.

Therapeutics.—The most frequently used and most effective remedies to abort a cold in the head in its incipency are *Acon.*, *Camph.*, and *Gels.* Next in order of usefulness are *Cepa.* *Arsen.*, *Ammon. carb.* and *Bell.* Later *Puls.*, *Kali bichrom.* and other remedies may be required according to the symptoms that may develop.

Aconite (2x).—Until late years Aconite has been considered as the most efficient remedy, and even now it is quite often indicated, and when so indicated is far more useful than either *Camph.* or *Gels.* There is chilliness, considerable fever, thirst, sneezing, watering of the eyes and nose; heat and smarting in the affected parts. Attacks coming on suddenly from exposure to dry cold winds.

Camphor (Tincture).—This drug has a remarkably abortive influence if given early during the chilly stage with sneezing, and before

other symptoms develop. Drop doses of the tincture should be repeated every few minutes.

Gelsemium (1x).—This remedy is used more of late than any other, and seems to exert a most remarkable effect in aborting recent colds, especially when resulting from exposure to atmospheric vicissitudes where there is dampness in the air, or after sudden cold changes following a season of warm, damp, relaxing weather. It is particularly useful where "grippy" pains predominate, in a class of cases greatly resembling, and often mistaken for, "grip" or influenza. There is also febrile chilliness, headache, fever without thirst, sore throat, languor and prostration. I generally use the first dilution. Goodno says: "For the attack, if seen in its incipency, *gelsemium* is almost a specific. If it acts favorably, a person subject to coryza should always have this remedy at hand, and have recourse to it upon the first appearance of symptoms. But a small percentage of cases fail to respond to its action. The dose should range from one to three drops of the tincture, repeated hourly, until the symptoms subside. The early administration of the medicine is necessary to success."

Cepa (3x).—This drug is most useful in acute coryza, having the characteristic of excessively profuse secretion, that from the eyes being bland and non-excoriating, while that from the nose is very acrid and excoriating. (Reverse, *Euphr.*) There is also more or less aching and sore, tired feeling throughout the body, and often hoarseness, with laryngeal cough.

Arsenicum (3x).—Especially useful in winter colds. Great chilliness and prostration, patient wants to be by the fire all the time; stoppage of the nose, with a copious discharge of acrid watery mucus, accompanied by burning of the nose internally and externally, not relieved by sneezing; intense thirst, drinking little and often; restlessness at night. *Ars. iod.* (2x) is useful where in addition to other arsenicum symptoms there is a decided asthenic tendency.

Ammon. carb. (6x).—Often abortive. Stoppage of the nose, excoriating discharge, and rawness and burning along the trachea.

Belladonna (2x).—Violent, throbbing headache; sneezing; dryness and tickling in nostrils; flushed face; lachrymation; great photophobia; throat sore and very dry.

Euphrasia (3x).—Excessive discharge of watery mucus from the nose; confusion in the head, with redness of the eyes and eyelids, and copious secretion of burning tears; photophobia; profuse bland coryza, with cough and expectoration only in the morning; eruptions in the wings of the nose.

Pulsatilla (3x).—Advanced stage; loss of smell and taste; nostrils

sore; wings raw; later a yellowish-green bland discharge; worse indoors; frontal headache; cold and chilly all the time; worse evenings.

Kali bichrom (3x).—Fluent coryza with swelling of the nose and nostrils, and discharge of tough, stringy mucus. Pressure at the root of the nose; closing stage of catarrh, when there is discharge of tough elastic plugs from the nose, with headache, alternating with fluent coryza, cough with expectoration of tough phlegm, which can be drawn into long strings; derangement of digestion.

Merc. cor. (3x).—Profuse, acrid, burning discharge; rawness and smarting in the nostrils; nose swollen and very sore; burning and smarting in all the air passages; severe cases after Gels.

Nux vomica (3x).—First stages, especially when brought on by damp, cold weather. Fluent coryza in the daytime, with stoppage of the nose at night. Sneezing and stuffed-up feeling in the nose. Heat in the head and face, with creeping chills, even when seated by the fire; inflammation in the frontal cavities, with severe headache; excessive itching in the nose, with expulsion of bloody mucus. Worse in a warm room and better in the open air.

Sanguinaria (1x).—Fluent, acrid, watery discharge, with frequent sneezing; tingling and stinging in nose and throat; heavy pain at root of nose; also over and in eyeballs.

Hydrastis (2x).—Discharge of thick yellow or greenish mucus; or watery, excoriating discharge with smarting and rawness in nose and throat; sneezing; air feels cold in the nose; dull frontal headache; discharge scanty indoors, profuse outdoors; secretion runs from posterior nares into throat.

Sambucus (1x).—Especially useful in the snuffles of infants; can not breath through the nose.

Dulcamara (2x).—Dry coryza worse and usually renewed after exposure to damp, cold weather, or comes on every time the weather becomes cooler, especially in the spring and autumn.

CHRONIC RHINITIS.

Synonym.—Chronic Nasal Catarrh.

Definition.—A chronic inflammation of the nasal mucous membrane, either hypertrophic or atrophic in character.

Pathology.—Chronic rhinitis may exist as a simple catarrh without either hypertrophic or atrophic changes, in which case the mucous membrane, especially over the turbinated bones, becomes irritable and inflamed, red, swollen and covered with a muco-purulent secretion, at first thin and clear, but later thick and tenacious in character and usually yellowish and greenish in color.

In hypertrophic rhinitis the same primary inflammatory conditions exist, followed by a chronic dilatation of the blood vessels, especially of the turbinated bodies, causing stenosis. There is an increase of the covering epithelium and of the connective tissue, glands and sub-mucous tissue. Sometimes the hypertrophy extends to the adenoid tissues in the naso-pharynx, giving a naso-pharyngeal catarrh. In addition there is also an accumulation of thickened mucus in the nasal and pharyngeal cavities.

Atrophic rhinitis presents characteristic conditions almost entirely opposite to those of the hypertrophic variety. It begins at a much earlier period of life and runs its course, in most cases, before the age when hypertrophic catarrh usually becomes pronounced. Atrophic catarrh is that form of inflammation of the nasal mucous membrane characterized by a destruction of the epithelial and glandular layers of the membrane, with a hardening of the deep or submucous layer, by a true atrophic process, accompanied by the formation of dry, greenish muco-purulent crusts, which emit a fetid odor known as *ozena*. The prominent pathological changes are, according to Wm. M. Stearns: 1. Profuse desquamation of the epithelial layer with natural decrease of tissue. 2. Decrease of the glandular layer and blood vessels. 3. A total disappearance of the vessels of the sub-mucous layer and especially of those composing the erectile tissues of the turbinated bodies. 4. Gradual atrophy of the turbinated bones.

Ulceration is not present in a true atrophic rhinitis.

The nasal passages are enlarged. The pharyngeal mucous membrane usually presents a dry and glazed appearance, and late in the disease the nasal membrane becomes pale and anemic.

Etiology.—Simple nasal catarrh may follow an acute attack, the latter being easily renewed upon slight exposure. Hypertrophic catarrh is a continuation of simple catarrh, especially after repeated attacks of acute rhinitis. Chronic nasal catarrh may also result from impure air, the continual inhalation of irritating dusts and vapors, lowered vitality, and congenital or acquired obstruction of the nasal passages, syphilis and less often tuberculosis.

Symptoms.—In simple cases there is some obstruction of the nasal passages, the smell is unimpaired, the secretion is at first thin, afterward thick and of a yellowish or greenish color, and the patient catches cold easily. In hypertrophic rhinitis the chief symptom is an obstruction of one or both nasal cavities, causing mouth breathing, which is worse at night. There is a thick mucous discharge from the nose, and from the posterior nares, the sense of smell is impaired, there is usually a nasal intonation of the voice, more or less frontal headache

and a sensation of fullness and weight at the root of the nose. The patient is particularly liable to attacks of acute coryza on slight exposure. If the Eustachian tube becomes involved, there is deafness. If the naso-pharynx be implicated, as is usually the case, the throat becomes dry, and there is a continual hawking to rid the naso-pharynx of tenacious mucus. Often the lachrymal canal becomes occluded and there is constant lachrymation. Inspection reveals the conditions already mentioned under pathology. This is the ordinary form of nasal catarrh so common in this country and Europe.

Atrophic catarrh is usually a disease of early childhood, beginning before the fifth year of age. It commences as an ordinary purulent rhinitis, and is more often found in children with broad noses, long nares and presenting an anemic appearance and evidences of a scrofulous constitution. At first the condition is supposed to be a simple cold, but it assumes a worse character, giving off an ichorous, purulent secretion that often keeps the anterior nares raw and sore even to the lip margins.

The most characteristic symptom is the horribly offensive, putrid odor of the discharges, the latter consisting of discolored crusts and a thick purulent mucus. There is a sensation of dryness in the nose and throat, the sense of smell is impaired or entirely lost, and nasal breathing is sometimes obstructed by the crust formations. The nasal cavities are enlarged and the mucous membrane has a dry, glazed appearance, adherent scabs being more or less present, but no stenosis.

The course of atrophic rhinitis varies from three to fifteen years.

Prognosis.—The prognosis of chronic hypertrophic rhinitis is favorable, if proper treatment be perseveringly maintained. The prognosis in atrophic catarrh is unfavorable in the later stages, as the atrophied membrane deprived of its constituent parts can never become normal. In the earlier stages much can be accomplished to arrest the atrophy and stimulate to a redevelopment of the tissues.

Treatment.—1. *Chronic Hypertrophic Rhinitis.*—The nasal mucous membrane should be kept cleansed by means of mild antiseptic douches or sprays. I generally use a spray of borolyptol or listerine one part to four of distilled water. A watery extract of hamamelis, eucalyptus or pine needle, well diluted, serves an excellent purpose as a spray or douche. Stearns recommends a colorless pinol solution. Soda preparations are often used. I think I have had equally as good results from a weak tepid solution of common salt and water as from anything else. I often follow the cleansing spray with an oily spray, generally eucalyptol and pine-needle oil, aa five per cent in benzoinol. Stearns follows a pinol spray with

the insufflation of a powder of bismuth and acacia. In acute attacks it protects the membrane, especially if the patient is disposed to take cold easily. The treatment by strong astringents or any irritating snuffs or powders should be avoided. Chromic acid is employed by specialists to remove hypertrophic tissues. Surgical measures are often employed for the removal of the hypertrophied tissue. These are often desirable and beneficial, but are equally as often abused and harmful. The cautery is sometimes used to destroy the morbid tissue, but as it always removes more or less healthy tissue also, it should not be used where milder measures will answer. Electrolysis is sometimes employed, the needle attached to the negative pole being inserted into the hypertrophic tissue, the positive being held in the hand. The patient should, if possible, have the advantage of a mild, dry, equable climate, and should spend much time in the open air and sunshine, avoiding inclement weather, changes and undue exposure. The diet should be simple and nutritious. The habits of life regular and systematic. Daily cool baths with friction are desirable.

2. *Chronic Atrophic Rhinitis*.—In these cases a cure is rarely performed, but much improvement and comfort can be secured by proper treatment. A cleansing spray should be used as in the hypertrophic variety, after which a spray of hydrogen dioxide or of glyco-thymoline may be used as a solvent, or the latter may be applied on a cotton-wrapped applicator, the scabs being thus gently removed. After the crusts are removed, benzoinol with eucalyptol and pinol may be applied as an oily spray. Stearns prefers to first use an application of the boro-glyceride by means of a cotton-wrapped probe, and then follow with an oily spray. He also advises an application of nitrate of silver to stimulate the nutrition of the parts. The latter may also be aided by a mild galvanic current applied directly to the membrane.

A very weak solution of permanganate of potash or of carbolic acid will best control the offensive odor. Stearns advises partly closing the anterior nares with cotton or wool, and compelling the patient to breathe with the mouth closed, thus exciting the venous circulation in the membrane, and producing serous exudation which softens and dislodges the crusts and lessens desquamation. In atrophic catarrh the use of salt and other soda preparations should be avoided. To prevent the scabs from reforming, Garrison recommends: Succus Calendulæ; Glycerini, aa Dr. 1; Aqua Rosæ, q. s. ad. oz. 11; Misce.

Therapeutics of Chronic Nasal Catarrh.

The use of internal medicines in the treatment of chronic rhinitis is of the utmost importance. Not only must the symptoms due directly to the catarrhal condition be combated, but it is equally important that the constitutional dyscrasia, often underlying the local disease, should receive careful consideration and treatment. The remedies already recommended for acute rhinitis may be called for from time to time as acute attacks develop, but the treatment of chronic cases requires, in the main, a very different class of remedies.

In *simple rhinitis*, with profuse muco-purulent discharge, *Puls.* is the remedy most often required. Next in order come *Kali bichrom.*, *Merc. sol.* (or *vivus*), *Ferr. phos.*, *Sang.*, *Nux vom.* and *Hydrastis*.

Hypertrophic Rhinitis.—*Am. mur.*, *Ars.*, *Ars. iod.*, *Calc. carb.*, *Ferr. iod.*, *Graph.*, *Hepar sulph.*, *Hydras.*, *Kali bichrom.*, *Kali iod.*, *Lycop.*, *Merc. sol.* (or *vivus*), *Merc. iod.*, *Nux vom.*, *Puls.*, *Sang.*, *Sepia*, *Sulph.*

Atrophic Rhinitis.—*Alum.*, *Arg. nit.*, *Ars. iod.*, *Aurum*, *Calc. carb.*, *Calc. iod.*, *Graph.*, *Kali bichrom.*, *Kali iod.*, *Kreos.*, *Merc. sol.* (or *vivus*), *Nitric ac.*, *Silic.*, *Sulph.*

Argent. nit.—Ulcers and erosions in the nose, covered with crusts, followed by slight bleeding when detached; profuse muco-purulent discharge; loss of smell; adjacent membranes involved, especially the eyes, with characteristic discharge.

Arsenicum (6x).—Discharge burning and excoriating; better in the open air and in hot weather; restlessness; sleeplessness. Weak, cachectic or malarial subjects.

Arsen. iod. (3x).—Delicate, cachectic and tuberculous subjects; assimilation defective; puffiness about the eyes; discharge varies, sometimes thin and copious, at others thick and scanty, or tenacious and frothy. I consider this remedy one of the most efficacious in chronic nasal catarrh.

Aurum (6x).—This remedy is particularly valuable in atrophic rhinitis, especially in syphilitic subjects, and when the bones are diseased and the discharges are extremely fetid. Nose filled with crusts, obstructing the breathing; nostrils ulcerated, painful, agglutinated; burning, itching and smarting in the nose; feeling of soreness in the nose, especially when touched; mental depression. *Aurum mur.* preferable in tuberculous cases.

Calcarea carb. (6x).—Especially useful in leucophlegmatic subjects, and when a constitutional dyscrasia is present, with malnutrition. Glands enlarged. Chronic discharge from the ears. Swelling of the

nose, especially at the root. Sore, ulcerated nostrils; offensive smell, as from bad eggs. Chronic hoarseness. General catarrhal habit. *Calcareo iod.* is often the better remedy, especially with the strumous diathesis and tuberculous glands.

Graphites (6x).—This remedy is most useful in atrophic catarrh. Dry scabs in the nose; sore, cracked and ulcerated nostrils; bloody mucous or purulent offensive discharge; stoppage of the Eustachian tubes, producing constant desire to clear the nose and throat; especially useful when there is much glandular swelling and eczematous eruptions on the skin; also in corpulent people, especially women.

Hepar sulph. (3x).—Swelling of the nose, which is painful like a boil, accompanied by catarrh and smarting roughness in the fauces. The bones of the nose are painful to the touch. The nasal discharge is thick and pus-like, sometimes tinged with blood. Headache, worse from motion. Catarrh confined to one nostril; every exposure to cold causes a new attack; cases of ordinary catarrh where mercurius has afforded partial relief, and improvement has ceased. Also useful when there is great sensitiveness; patient is chilled by the slightest draft of air; the least injury causes ulceration; swollen, indurated tonsils, and hard glandular swellings about the neck.

Hydrastis (2x).—Atrophic catarrh with ulceration and bloody purulent discharge; useful in all varieties; constant discharge of thick, yellow mucus; secretion drops from posterior nares, thick and tenacious (very characteristic); yellow, greenish, offensive discharge; watery, excoriating, with burning, smarting and rawness in the nose; discharge scanty in the room, profuse out of doors; air feels cold in the nose. If at the same time, there is constipation and a general atony of the system, the remedy will prove all the more efficient.

Stearns recommends *Hydrastin mur.* (yellow) 4x.

Kali bichrom. (3x).—A most valuable remedy in all varieties when there is present the characteristic tenacious, stringy mucous discharges; nose obstructed; heavy, pressive pain at roots of nose, or shooting pains from root of nose along frontal sinuses; ulceration; sometimes hard plugs form in nostrils, and when detached leave an eroded or ulcerated surface; dropping of mucus from the posterior nares.

Kali iod. (2x).—Atrophic catarrh of syphilitic origin. Discharge from the nose of greenish-black or yellow matter, of a foul, sickening smell; of decomposed greenish-red blood; sensation of fullness and tightness at root of nose; throbbing and burning pains in nasal and frontal bones, with swelling. Gnawing sensation in nasal bones, with lancinating, boring pains extended to the forehead.

Kreosotum (3x).—Atrophic catarrh, discharge acrid, very

irritating and exceedingly offensive, with burning in the nasal passages.

Merc. sol. (3x).—All varieties. Especially valuable in syphilitic ozena. Discharge profuse and watery; also, discharge of greenish, fetid pus from the nose. Liquids which the patient attempts to swallow pass back into the posterior nares. Chronic inflammation of the throat and tonsils. In acute attacks, copious discharge of watery saliva, swelling, redness, and soreness of the nose; night sweats and feverish heat; symptoms aggravated by warmth or cold; pains in the limbs; bleeding from the nose during sleep or on coughing; aphthæ; fetid odor from the mouth; ptyalism; catarrh, with cough and salty-tasting expectoration, or with mucous diarrhea. The roof of the mouth is often dry, and there is constant inclination to swallow. Catarrh of the Eustachian tubes. Hardness of hearing; crackling and roaring in the ears, with periodical stoppage of one or both ears.

According to Stearns *Merc. dulc.* will relieve congestion of the turbinated bones.

Merc. iod. (3x).—Particularly useful in chronic naso-pharyngeal catarrh. The discharge consists of a tough, white or yellowish mucus, which forms chiefly about the posterior nares and in the postnasal cavity. It is also useful in those profuse, acrid, long-lasting discharges which excoriate the nostrils and upper lip. Shooting pains at root of nose and along frontal sinuses. Morse, in Arndt's "System of Medicine," says, "I have used the *Mercurius iodatus* with great benefit in cases in which inflammation of the nasal mucous membrane extended into the lachrymal duct and sac. It seems peculiarly adapted to such cases occurring among children. I have occasionally used it as low as the 1st dec. trit., with prompt relief in cases where the catarrhal inflammation of the posterior nares ran high, sometimes involving the entire pharynx."

Nitric acid (3x).—Especially useful in atrophic catarrh of syphilitic origin, or in those who have taken much mercury. Discharge purulent, dirty, yellowish-green, offensive and corrosive. Stitches as from a splinter in the nose, on touch.

Nux vom. (3x).—Discharge fluent during the day, stopped at night; worse in the warm room, better in the cool air; chilliness even in a warm room; bloody, mucus discharge; frontal headache. Dry catarrh of infants. Especially associated with abdominal complaints and constipation.

Pulsatilla (3x).—See Acute Rhinitis.

Silicea (6x).—Especially useful in atrophic catarrh. Nasal passages dry, painful, excoriated, covered with crusts; soreness as if

beaten in nasal bones; acrid, corroding discharge. Valuable in cases due to a strumous diathesis, especially when there is induration and suppuration of glands; it reaches deep-seated catarrhal processes. Necrosis of bones.

Sulphur (6x to 30x).—Long-standing, obstinate cases, especially in characteristic sulphur subjects, those who are subject to eruptions upon the skin, and those in whom the skin is rough and harsh and the hair coarse; light complexioned; lean, stoop-shouldered; offensive odor from the body; general dislike to and aggravation from washing or bathing; those who have very red lips, and redness of the other orifices of the body, often accompanied by soreness and burning. Profuse secretion of thick purulent mucus; offensive odor; itching and burning in nostrils; nose swollen, red and inflamed; boils and eruptions on nose.

AUTUMNAL CATARRH.

Synonyms.—Hay Fever, Hay Asthma, Rose Cold.

Definition and Etiology.—An affection of the upper air passages characterized by intense hyperemia, obstruction and profuse watery discharge, without inflammation, and often associated with asthmatic symptoms, occurring periodically during the summer in persons who, from an idiosyncrasy, are susceptible to the irritation of certain stimuli upon a hypersensitive mucous membrane. The stimuli most often emanates from the pollen of certain flowering plants. One form of hay fever, usually mild in character, known as "rose cold," occurs in the spring and early summer, and is excited by the odorous principle of the pollen of the rose. This form generally runs from four to six weeks. The autumnal form does not come on until August or September, and never continues after a heavy frost. The latter is much the more prevalent and is that form which is referred to as hay fever or autumnal catarrh. It occurs much oftener in the male sex, and generally develops before the twentieth year of age. It is supposed to be primarily due to some neurotic taint of the system, is often hereditary, and frequently affects several members of the same family. According to Osler, "An attack may even come on through association of ideas. The well-known experiment of J. N. Mackenzie, of inducing an attack in a susceptible person by offering her an artificial rose to smell, strikingly illustrates the neurotic element in the disease." It is said to attack more readily those who enjoy exemption from ordinary catarrhal trouble. It is prone to attack the higher, educated classes, presumably on account of their higher nervous organization. It affects the inhabitants of the city more than the country,

and is more common in America than Europe, prevailing almost exclusively in the two latter countries. Certain climates, chiefly mountainous, marine and far northern latitudes, afford perfect immunity from the disease, not only to permanent residents, but also to sufferers who make annual pilgrimages to these places.

Symptoms.—The symptoms are usually those of an acute rhinitis with those of bronchitis or asthma superadded. The only characteristics are the sudden onset and marked annual periodicity, the disease returning each year on almost precisely the same date, and remaining until the coming of a heavy frost. Sometimes the usual symptoms of hay fever do not appear, the patient suffering instead from bronchial asthma during the same period, and with the same limitations. In other cases, as, previously mentioned, the two conditions are combined, causing the patient great suffering and distress.

Diagnosis.—This is readily established from the nature of the disease, the season of its occurrence and the annual periodicity. The *prognosis* is favorable as to life, the health being seldom impaired. The prognosis as to cure is not so favorable. Some cases recover spontaneously, but usually the complaint follows its victim through life unless it is checked by a permanent removal to some immunizing climate. Comparatively few cases are cured or even temporarily benefited by the use of medicine, but occasionally very material benefit is realized.

Treatment.—The chief element of treatment is climatic. If possible, the patient should by travel find the location that suits his case, and thereafter spend his hay-fever season at that point. Some are benefited by one locality and others by another. Some go to the White Mountains, others to the Adirondacks or to the Northern Peninsula of Michigan, and still others require a sea-voyage. Many can not take advantage of such temporary changes, and are obliged to fight it out at home, with such relief as they can secure from their own and others' experience. Such patients should, about two weeks before the anticipated attack, begin thoroughly and frequently cleansing the nasal and postnasal cavities with hydrogen dioxide. Hay-fever patients should pay careful attention to hygienic measures, and lead a careful, abstemious and systematic mode of life.

Therapeutics.—The *therapeutics* of hay fever are quite meager so far as actual results are concerned.

I have found *Arsenicum* (2x) and *Ipecac* (2x) the most successful remedies, and have achieved remarkable results in some cases by giving them in combination in the second decimal trituration. Under the circumstances I have no apology to offer for such a non-homœopathic

prescription. The *Arsenite of potash*, *Arsenate of quinine* and *Arsenite of copper* are recommended. The *Iodide of arsenic* is extensively used especially when the nasal discharge is exceedingly acrid. The late Dr. E. M. Hale, who was himself a sufferer from the disease, recommended the latter as a prophylactic. He says in his work on Practice, "I have found that, beginning a week or two before the expected attack, if the iodide of arsenic be given in doses of the 1-100 or 1-1000 of a grain three times a day, the disease does not appear. It has been reported that the same results have followed the use of Fowler's solution of arsenic, one to three drops, three times daily. The double iodide of mercury and potassium in the 6x trituration, and the arsenate of quinine, are said to be preventive." Hale has used *terpine hydrate* 1x with better results than he could "get from ipecac sambucus or stibium." The drug is recommended by the old school in fifteen-grain doses four times in twenty-four hours, and the results are said to be highly curative. Hale says that "during the course of the disease I have known naphthaline, in all doses, from five grains of the crude drug to the 3x trituration to terminate the severity of the symptom in a few days. Its internal use can be aided by a spray of the one-or two-per-cent solution in albolene or benzoinol, or even in water; chloroform water, 1 to 1000, is an excellent vehicle. The iodides of arsenic, gold and potassium will often entirely cure the nasal and pharyngeal symptoms in a short time."

"Sabadilla is an unrivaled remedy for the spasmodic and paroxysmal sneezing (in the morning) with only slight catarrhal discharge. The asthmatic condition, ipecac, grindelia, quebracho, arsenite of copper, and euphorbia pilulifera will greatly palliate if not remove, but they must be given in appreciable doses, ten to twenty drops of the tincture every few hours (arsenite of copper 3x). "The dry, harassing cough which often attends the first stage, destroying the patient's rest and sleep, can generally be controlled by doses of hyoscyamus 1x, or hyoscyne hydrobromate, 1-500 of a grain." *Cocaine* applied locally has a remarkably soothing effect, but the ultimate results from its use are so decidedly harmful that it should never be employed. Anders recommends *Atropin* either internally or hypodermatically until dryness of the throat appears.

EPISTAXIS.

Synonym. — Nosebleed.

Definition. — Hemorrhage from the nose. This is the most frequent of all forms of hemorrhage, and occurs in both sexes and at all ages.

Etiology. — Nosebleed may be either idiopathic or symptomatic. Idiopathic nosebleed occurs most often in the young and robust, and is frequently salutary in its effects. It results oftener from traumatism than from any other cause: blows, picking at the nose and the presence of foreign bodies in the nose. It is said also to occur as a result of fracture at the base of the skull. In persons having an unusually delicate schneiderian membrane, a vigorous blowing of the nose, or other violent exertion, often produces bleeding at the nose. It may also occur as a result of a highly rarefied atmosphere, as in balloon or mountain ascensions. Symptomatic nosebleed may occur either from local conditions, such as ulcers or polypus in the nose or from various constitutional states, especially low, cachectic conditions. Acute infectious fevers, especially typhoid; chronic anemia; leukemia; hemorrhagic diathesis; purpura; venous engorgement due to heart or lung disease. Nosebleed occurs frequently in delicate children at about puberty, and is of frequent occurrence in plethoric children. It is the most frequent form of vicarious menstruation.

Symptoms. — The blood usually flows in drops, and may be from one or both nostrils. In rare cases the flow of blood is continuous. In some instances the blood flows into the pharynx and is coughed up, or into the stomach and is vomited. When prolonged or often repeated, epistaxis produces anemia and weakness, but death is an extremely rare occurrence. An attack usually lasts but a few minutes, but it may last several days, and a large amount of blood be lost.

Diagnosis. — The diagnosis is usually easy, but when the blood has gravitated into the pharynx and is coughed up, there may be danger of confounding it with hemoptysis, and when it passes into the stomach and is vomited up, with hematemeses. In such cases a rhinoscopic examination will usually reveal the cause, though in constitutional cases a careful physical examination is sometimes required.

Treatment. — Simple measures should first be tried, such as raising the arms above the head and the application of ice to the nose or the back of the neck, or the use of either an ice-cold or a very hot nasal douche, injections of witch hazel or pure lemon juice, together with the administration of the indicated remedy. The patient should remain quiet and carefully avoid clearing the nose by either blowing or picking, allowing any coagula that may form to remain. If simple measures do not avail, a careful search for a local cause should be made, and if such be found, the treatment applied accordingly. In case a bleeding point is discovered, tannin, alum or

other astringents may be applied, or a saturated solution of antipyrine, or a solution of chromic acid, or the point may be cauterized with solid nitrate of silver. Sometimes plugging the anterior nares with gauze is all that is required, but in severe and obstinate cases it is necessary to plug the posterior nares. Anders says that prolonged pressure upon the facial artery as it passes over the inferior maxilla may be efficacious. Dr. Agnew used successfully a long strip of bacon rind "passing it through the nostril and allowing it to stay there some time."

Therapeutics.—For the young and plethoric, *Aconite* (2x), *Belladonna* (3x), *Ferrum phos.* (3x), or *Ipecac* (2x) are most often useful, according to the symptoms. For the weak and debilitated, *Cinchona* (2x), *Crotalus* (3x), *Ferrum* (3x), *Lachesis* (6.), *Hamamelis* (1x), *Phosphorus* (3x) or *Secale* (2x) should be carefully considered. I find *Erigeron*, in three-drop doses of the oil, to be a most invaluable remedy in all severe nosebleeds, especially if the blood is bright red and is increased by every movement of the patient. *Crocus* (1x) may be useful if the blood is dark, viscid and stringy. *Arnica* (2x) should be used for nosebleed resulting from direct injuries. Goodno recommends "*ferrum muriaticum* in the first decimal dilution or drop doses of the tincture, for hemorrhages occurring in association with fevers and other conditions characterized by blood deterioration; *ferrum phosphoricum* for the recurring hemorrhages of delicate children in whom local causes are not apparent; and *hydrastinine hydrochlorate* in the third decimal trituration for hemorrhage of a serious character, regardless of cause. No remedy is so generally useful."

II. DISEASES OF THE LARYNX.

ACUTE CATARRHAL LARYNGITIS.

Synonym.—Acute Laryngeal Catarrh. When occurring in infants and young children, it is known as Catarrhal Croup.

Definition.—An acute catarrhal inflammation of the larynx.

Etiology.—Acute laryngitis may occur primarily, but it more often occurs as an extension of, and associated with, catarrhal affections of the nose and throat. It is most often caused by exposure to cold and dampness, especially while overheated or after overuse of the voice. It may also result from traumatism, from the inhalation of irritating vapors or a dust-laden atmosphere, from swallowing corrosive poisons and from foreign bodies. A sedentary life, living in badly ventilated apartments, overheated rooms, and immoderate smoking, the cigarette habit or the use of concentrated

alcoholic liquors predisposes to the disease. Acute laryngitis also occurs as secondary to, and associated with, infectious diseases.

Symptoms.—Usually the first symptom experienced is a soreness in the larynx, with dryness and tickling and frequently a constant desire to clear the throat. This is soon followed by a huskiness of the voice, which may go on to hoarseness or even to complete aphonia, and a cough develops that is croupy or barking in its character, and is often paroxysmal and very harassing, and is induced by talking or by breathing cold air. The soreness in the larynx may increase to a distinct pain, and becomes quite severe, being usually aggravated by swallowing, talking or coughing. In other cases a burning, irritating feeling alone is complained of. Pressure over the cricoid cartilage may cause pain or a paroxysm of coughing. In severer cases with edema of the glottis, dyspnea may be a marked symptom. The difficulty of breathing may be continuous or paroxysmal; it may lead to asphyxia. This complication is more common in those suffering from alcoholism and Bright's disease. As a rule there is a slightly elevated temperature during the severity of the attack. Laryngoscopic examination reveals redness, swelling and tumefaction of the laryngeal mucous membrane, involving also the vocal cords and the ary-epiglottidian folds. There may be an oversecretion of mucus or only a slight mucoid exudation occurring in streaks or patches. In severe cases superficial ulceration may be present, or an edematous condition, which latter may prove a formidable and sometimes fatal complication. In children the clinical course of acute laryngitis presents somewhat different features, particularly an associated spasm of the constrictor muscles of the larynx and a tendency to nightly aggravation and recurrence. Such cases are known as catarrhal croup, false croup or spasmodic croup. The difference between acute laryngitis in adults and in children is due in a large degree to the relative smallness and sensitiveness of the child's larynx, and its greater vascularity, which also accounts for comparative frequency of attacks during childhood. They more often occur under three years of age, though some children are subject to attacks until they are ten or twelve years of age. The child is usually awakened in the early hours of the night with a severe and distressing dyspnea accompanied by hoarseness and a barking, croupy cough, and frequently some fever. These symptoms gradually subside in the course of an hour, the ordinary symptoms of laryngitis usually remaining for a day or two, with possibly recurring nocturnal attacks, especially if proper care and treatment are not given. Sometimes catarrhal croup is followed by catarrhal bronchitis.

Diagnosis.—With the clinical course above mentioned an error

in diagnosis is hardly possible, yet there may be considerable difficulty in deciding as to the presence of membranous laryngitis, edema of the larynx or laryngismus stridulus. A laryngoscopic examination might easily determine the diagnosis, but unfortunately such an examination is rarely possible in children. In membranous laryngitis the dyspnea is more continuous, the sawing respiration being equally prominent during both inspiration and expiration, whereas in catarrhal laryngitis expiration is usually easy, and seldom accompanied by the sawing sound. The constitutional symptoms are also more severe, and the cervical glands are swollen. In laryngismus stridulus the attack begins with explosive violence and is not accompanied by fever or other catarrhal symptoms. The presence of edema can often be only determined by the use of the laryngeal mirror.

Prognosis.—The prognosis is favorable unless marked edema occurs, in which case collapse and death may occur rapidly. The disease generally terminates in recovery in from a few hours to five days.

Treatment.—Exposure to cold either in or out of doors must be absolutely avoided. The patient should remain continually in a warm room (75° to 80° F.), and if the attack be severe, should be kept in bed. The atmosphere of the room should be kept moist by the most accessible means. The larynx should be kept, as nearly as possible, at perfect rest, the use of the voice being strictly prohibited. Cold applications to the larynx are considered of great service. These should be in the nature of a pack. A piece of old linen about four inches wide may be folded twice, dipped in ice-cold water, applied around the neck, and covered tightly with a flannel bandage. I much prefer hot applications throughout the attack. It is easier and often equally as serviceable to anoint the external throat with vaseline or some oily substance, the old-fashioned "goose-grease" answering a good purpose, and afterward applying absorbent cotton well heated, the latter being retained in close approximation to the neck by means of a flannel bandage. Some use Trask's Ointment instead of vaseline, as it contains a small amount of tobacco and seems to have a relaxing effect, especially in children. Inhalations of steam or of medicated steam are often of great service. I usually use a tin cup with a spout, or an ordinary teapot, filled with boiling water, to which I add one or two drachms of compound tincture of benzoin, and allow the patient to inhale the steam. A steam atomizer is much better if one is at hand. In the case of children it may be necessary to extemporize a tent over the head into which the steam is conducted. Iodine, bromine, menthol or eucalyptol may be used in place of the benzoin if for any reason preferred.

Therapeutics.—In the first stage *Aconite* (1x) is the remedy usually indicated, especially in children, and if fever be present. It is often the only remedy required. If there is fever, but no anxiety and restlessness characteristic of aconite, *Ferrum phosphoricum* (3x) may answer a better purpose. If there is no fever, *Spongia* (3x) will generally prove more serviceable, or, possibly, *Iodine* (2x) or *Bromine* (2x), according to the individual peculiarities of the case. If there is a mucous "break" in the croupy cough and respiration *Hepar sulph.* (3x) is the remedy. The latter often follows *Aconite* or *Spongia* well and completes a cure. In severe cases that do not readily yield to *Aconite* or *Spongia*, where the cough remains hoarse and metallic, possibly for several days, with nocturnal exacerbations, *Kali bichrom.* (3x) is the remedy. The latter is frequently indicated in the catarrhal laryngitis of adults. *Belladonna* (3x) may be required where there is flushed face, aphonia, perspiration, sleeplessness, dry cough before midnight; much vivid redness, sensation as of dust in the larynx, or of constriction; painful deglutition. *Phosphorus* (3x) is often required for adults, very rarely for children, but may be, late in the disease, when collapse threatens, with spasmodic cough, scanty expectoration, rattling breathing, weak, thready pulse. In severe cases *Tartar emetic* (3x) is often invaluable when there is dyspnea, pallor of countenance, rattling cough, accumulation and rattling of mucus in the throat. Dr. T. F. Allen recommends *Benzoin* 1x dilution when there is hoarseness, accompanied by a sensation of rawness extending from the larynx into the pit of the throat, but not further down. Goodno prefers the tincture on sugar. According to Hale, "Iodide of lime is an admirable remedy when there is rawness, burning, soreness and tenderness of the larynx, with frequent cough, hoarse and barking, and a sensation of tightness and constriction." Dissolve five grains of the crude drug in half a glass of water, and give a teaspoonful every half hour.

Also consult *Hyos.* (3x), *Sang.* (1x), *Samb.* (1x), *Ipec.* (3x), *Lobelia* (2x).

CHRONIC CATARRHAL LARYNGITIS.

Synonym.—Chronic Endolaryngitis.

Pathology.—The mucous membrane of the larynx is congested and thickened, and the proper motility of the vocal cords is impaired.
 • Secretion is excessive or scanty and tenacious.

Etiology.—Chronic laryngitis frequently results from repeated acute attacks, from long-continued use of the voice, from inhaling irritating dust or vapor, from excessive smoking, from the long-con-

tinued use of alcoholic liquors and from syphilis. All these are predisposing and sometimes exciting factors. The disease most often occurs from, and is associated with, chronic naso-pharyngeal catarrh, especially when habitual mouth breathing is present. It sometimes complicates chronic bronchitis and pulmonary tuberculosis.

Symptoms.—Hoarseness even to complete aphonia is the most prominent symptom. The hoarseness is generally worse in the morning on rising, and improves on using the voice, and during the warmth of the day, becoming somewhat worse again toward evening. There is an almost constant tickling in the larynx, inducing a desire to clear the throat. There is also a tickling cough, which is always worse at night and in damp weather.

Prognosis.—Most cases can be cured if the patient will follow closely a proper form of hygienic and medical treatment. Otherwise the prognosis as to complete recovery is hopeless. Sometimes a change of climate is necessary.

Treatment.—Removal of the cause is of first importance. If naso-pharyngeal catarrh is present, it should receive attention. Heated rooms and impure air are to be avoided, smoking is to be prohibited, and proper exercise in the open air is to be insisted upon. Mufflers and neck handkerchiefs should be avoided. In the case of public speakers and singers, the voice must have complete rest. In many cases climatic changes are largely responsible, and in such, a change of residence is absolutely essential to a cure. MacKenzie advises a sea-voyage or the seashore. Anders prefers a pine-forest resort at a low elevation. Most cases require a warm, dry, equable climate. Others require some moisture in the atmosphere.

The parts, including the naso-pharynx, should be kept cleansed by means of alkaline douches or sprays, the soda salts being usually preferred, using about ten grains to the ounce. Borolyptol, listerine and other mild antiseptic preparations may be used, diluted with three or four parts of water.

The use of the carefully selected homœopathic remedy is, next to securing cleanliness of the parts, most important.

Hepar Sulphur (3x).—I consider this the most often indicated and most effective remedy. Dr. J. S. Mitchell says in Arndt's System of Medicine, "Hepar sulphur has done so much for me that I consider it the most effective of all remedies. Its use in cases occurring in professional singers has been attended not only with such success that I do not hesitate, on taking the case, to express the belief that not only the laryngeal inflammation will be relieved, but that a manifest improvement will be apparent in the quality of the voice."

The hepatic patient is very sensitive to cold air, and has a tendency to easy and profuse perspiration.

Causticum (3x).—Hoarseness and aphonia always worse mornings and evenings, and accompanied by rawness and scraping in the throat. According to Dr. J. S. Mitchell it "is of service for the paralytic weakness, which sometimes remains after the mucous membrane has been restored to its normal condition. It is not a centric paralysis, but simply due to the irritated condition of the muscles remaining after they had been rendered somewhat sodden by the inflammatory process."

Phosphorus (3x).—Hoarseness and aphonia; larynx extremely sore so that it causes pain to talk or cough; voice tires easily; rawness in larynx; tickling; hawking; dry, hacking cough.

Kali bichrom. (3x).—Hoarseness and accumulation of much tenacious mucus in the larynx in the morning; tickling in larynx, causing hawking, coughing and clearing the throat; tickling extending into mouth and ears. Useful in subacute attacks.

Argent. met. (3x to 30x).—A valuable remedy in chronic laryngitis and hoarseness, especially in public singers or speakers. Cough from laughing or talking, or from irritation in larynx, with easy expectoration of white, thick mucus, like boiled starch.

Argent. nit. (6x) is not so often useful as arg. met. It is especially useful where there is a purulent expectoration, and where ulcers are present.

Manganum (6x).—*Obstinate hoarseness and roughness, especially in the morning* and in the open air; better from smoking. The chief sphere of usefulness is in laryngeal affections. Dry cough from loud reading or talking, with painful dryness, roughness and constriction of larynx, causing sensation to cough, with which mucus was loosened after long hawking. Inclination to cough mornings. Deep cough, without expectoration; ceasing on lying down. Especially useful in anemic and tubercular patients.

Also consult *Ars. iod.* (2x), *Lach.* (6.), *Iod.* (3x), *Nitric ac.* (3x), *Sang.* (1x), *Selen.* (30x), *Tartar emet.* (3x).

MEMBRANOUS LARYNGITIS.

Synonym.—Membranous Croup.

Pathology.—The modern idea, so prevalent, that diphtheritic laryngitis and membranous laryngitis are identical is erroneous. Cases of membranous croup do occur in which neither the Klebs-Loeffler bacilli nor the constitutional symptoms of diphtheria are present. In such cases the exudation is confined to the larynx, sometimes

spreading to the trachea and bronchi, but very rarely involving the pharynx, palate or tonsils.

Etiology.—Membranous croup is a disease of childhood rarely occurring after seven years of age, and seldom before the second year. So far as known the only exciting cause is exposure to cold and dampness.

Symptoms and Diagnosis.—The approach of membranous croup is insidious, the child having a hoarse, croupy cough for several days and a gradually increasing hoarseness, with nightly exacerbations, the cough then becoming very metallic and brassy in character. After two or three days the obstructive membrane is well established, and from that point the symptoms so closely resemble those of diphtheritic laryngitis that their difference is not easily recognized. The following points of differential diagnosis are given by Lockwood. “(1) The patient is a child between two and seven years of age; (2) there is no history of exposure to diphtheria; (3) the patient does not act as a source of contagion to others; (4) albumen and casts are not apt to be found in the urine; (5) the symptoms are those of laryngeal obstruction and inflammation rather than those of obstruction, prostration and sepsis; (6) the lesion occurs in a primary form in the larynx, whereas in diphtheria the membrane on the larynx is almost invariably secondary to membrane on the pharynx, the tonsils, or the palate; (7) cardiac failure, peripheral neuritis with paralysis, and nephritis are not observed as sequelæ.”

Prognosis.—Membranous croup is a formidable disease and the prognosis always grave, though many cases recover. The course is usually from five to ten days. In some instances where recovery has taken place, the membrane has not been entirely eliminated for several weeks.

Treatment.—Owing to the possibility of an error in diagnosis, the patient should be at once isolated and the usual local treatment of diphtheria adopted. The atmosphere of the room should be kept warm and moist. The patient should be made to breathe a moist vapor medicated with the compound tincture of benzoin. To accomplish, this, it is usually necessary to improvise a tent over the patient's head into which the medicated steam is conducted.

Therapeutics. Kali bichrom.—This is the remedy of value above all others in membranous croup. I generally use it in the first decimal trituration, five or six grains to half a glass of water, a teaspoonful from ten minutes to an hour apart.

Iodine (1x).—According to T. F. Allen, “Iodine is indicated in cases in the early stage, with more or less fever, with dry skin and a very dry

cough, great difficulty in respiration; it follows closely after aconite; if aconite has been given and the patient is not improving, or if aconite has only relieved his restlessness and extreme anxiety, but not the cough, the patient is still dry and hot and the cough still croupy, then give iodine; it is, however, rarely useful after febrile excitement has disappeared or if the patient perspires freely."

"(1) My own experience is fully in accord with that of Elb who recommends it in cases with violent fits of coughing, threatening suffocation, with whistling tone, and great anxiety; hissing, sawing, respiratory sound, painfulness of the larynx; hoarseness and red face, synochal fever; consequently at the first appearance of the disease. (2) When there are long-continued fits of loose-sounding coughing, without great danger of suffocation, which affords no relief; slight painfulness of the larynx; strong sawing and hissing, but not whistling, respiratory sound; temperature of the skin not elevated; frequent, hard, but not full pulse. (3) Absence of cough or occasional short, loose-sounding, croupy cough; constant but moderate oppression on the chest; rough, sawing, not whistling, respiratory sound; cold, moist skin, small, hard, quick pulse. (4) Involvement of the bronchial ramifications, with absence of cough; inaudible vesicular inspiration; short, quickened respiration; loss of voice, with weak, sawing, rather rattling respiratory sound; pale, haggard countenance, cold, clammy sweat; small, rapid thready pulse."

Iodide of Lime.—Dr. A. G. Beebe advocates this remedy strongly in non-diphtheritic cases, he having used it with uninterrupted success for over twenty years. He gives the crude drug in doses of one-fourth grain every hour, or, in urgent cases, as often as every fifteen or thirty minutes for a few times. It may be given in water, or, as Dr. Beebe prefers, mixed (not triturated) with milk sugar, so as to form a convenient-sized dose.

Tartar emet.—In severe cases, where death was imminent, I have apparently saved life by the use of this drug. Placing one-half grain of the crude drug in half a glass of water, and giving a teaspoonful every fifteen minutes until the cough began to show a moist, loose character, or pieces of membrane were coughed up. I saved the life of my own child in this manner, after several consulting physicians had pronounced the case hopeless.

Also consult *Hepar sulph.* (3x), *Bromine* (2x), *Bell.* (2x), *Sang.* (1x).

TUBERCULAR LARYNGITIS.

Synonym.—Laryngeal Phthisis.

Pathology.—The mucous membrane is thickened by tubercular deposits and by edema, especially over the arytenoid cartilages. Tubercles appear upon the surface, and often coalesce to form masses, which may ulcerate. The resulting ulcers are broad and shallow, having grayish bases and being surrounded by thickened mucosa. There may be a destruction of the deeper tissues by extension of the ulceration. The disease may spread to the pharynx, the epiglottis or the esophagus.

Etiology.—Primary tuberculosis of the larynx may occur, but the disease is usually secondary to pulmonary tuberculosis, in which it may occur early, and is present in about one fourth of the cases. According to Osler, "There may be well-marked involvement of the larynx with signs of very limited trouble at one apex. These are cases which, in my experience, run a very favorable course." Tubercular laryngitis occurs oftener in men than in women, and is most frequent between the twentieth and thirtieth years of age.

Symptoms.—Huskiness of the voice advancing to hoarseness and possibly to complete aphonia is always present. This is not of great diagnostic importance, as it may result from other causes, especially from catarrhal laryngitis, which is frequently present in phthisical patients. There is, however, as Osler says "something very suggestive" in the character of this hoarseness. He says his attention has frequently been directed to the lungs simply by the quality of the voice. I have had the same experience, yet am not able to describe in words the difference between this hoarseness and that which arises from other conditions. A cough is usually present and is quite annoying and painful. Sometimes it is altogether absent. After ulceration has occurred, the cough has a husky sound that is quite peculiar. Pain on talking may be severe, and neuralgic pains running to the ears may be complained of. Pain on swallowing may be so distressing that the patient is with difficulty prevailed upon to take sufficient food; this pain usually results from tubercular involvement of the epiglottis or the pharynx. Dyspnea may appear late in the disease, in either a constant or a paroxysmal form, sometimes necessitating tracheotomy to avert death from suffocation or to render the patient's condition a trifle more endurable.

Diagnosis.—In the first stages a diagnosis is difficult unless pulmonary tuberculosis is present. Later the laryngeal mirror will plainly show the tuberculous masses and ulcerations. In case of doubt,

the secretion from the base of an ulcer may be examined, for the tubercle bacilli.

Prognosis.—The prognosis as to duration of life depends entirely upon the presence and extent of pulmonary tuberculosis, and the beneficial effects sometimes obtained from a change of climate. Death may occur from suffocation, inanition or exhaustion, difficulty in swallowing on account of involvement of the epiglottis often being the primary cause.

Treatment.—The parts should be kept cleansed with a ten-per-cent solution of boracic acid, after which I use a spray of benzoinol with five per cent each of eucalyptol, pinol and menthol. Peroxide of hydrogen is sometimes used as a spray with much benefit. Borolyptol or listerine diluted with two or three parts of water makes an excellent cleansing spray. Beechwood tar applied with a hot-air vapor instrument is a most valuable remedy. Iodine may be used in the same manner. Dilute lactic acid is highly recommended as a local application. Dusting the larynx with iodoform is advised by Bosworth and others. A solution of morphine or cocaine may be used locally as a palliative. Surgical treatment of tubercular laryngitis consists in the scraping out of tubercular deposits, the parts being exposed by a median thyroidectomy if necessary. Much success is claimed for this method of treatment.

The hygienic and climatic treatment are the same as for pulmonary tuberculosis. The remedies that have proved of most value in advanced cases are: *Manganum* (6x), *Stannum* (6x) and *Phosphorus* (6x). In the early stages *Ferrum phos.* (3x) and *Droscra.* (3x), *Ars. iod.* (3x), *Iodine* (2x), *Nitric ac.* (3x), *Kali iod.* (1x), *Sang.* (1x), and *Brom.* (2x) should be consulted. *Apis.* (3x) is required if edema be present. Also consult remedies recommended for catarrhal laryngitis.

EDEMA OF THE LARYNX.

Synonyms.—Edematous Laryngitis, Edema of the Glottis.

Definition.—An infiltration of the areolar tissues of the larynx, and about the glottis with a serous or sero-purulent fluid.

Pathology.—Infiltration into the loose connective tissue of the ary-epiglottic folds, the glosso-epiglottic ligament, the base of the epiglottis, and the interarytenoid space. If the true vocal cords are inflamed, their color changes, and instead of appearing white, glistening and brilliant, they are dull, grayish-red or violet-red in patches. If the swelling be the result of purulent infiltration, the parts affected present a deeply congested color, with here and there spots of a yellowish hue.

Etiology.—Edema of the larynx may result from acute laryngitis, or occur in the course of tubercular or syphilitic laryngitis, erysipelas of the face, diphtheria, scarlet fever, heart disease, Bright's disease, abscess of the neck and smallpox, and may occur in a rapidly acute form from the swallowing of hot fluids or caustics.

Symptoms.—The onset may simulate an ordinary attack of acute laryngitis with gradually increasing difficulty of breathing, ultimately threatening suffocation. In acute cases the onset may be sudden and severe, the voice becoming rapidly husky and suppressed, and the dyspnea so severe that paroxysms of impending suffocation occur within a very short time. The cough is at first dry and harsh, but as the infiltration increases, becomes stridulous and suppressed. By gently passing the finger into the throat, the swollen epiglottis may be detected, and the ary-epiglottic folds be so tumified as to be readily outlined. The same may be plainly seen by using a tongue depressor, though a laryngeal mirror is sometimes required.

Diagnosis.—The character of the symptoms and local inspection is always sufficient to establish the diagnosis.

Prognosis.—As a rule the prognosis is unfavorable, though remarkably favorable results occasionally follow proper treatment. Early operative interference has afforded beneficial results. Even when local measures have removed the obstruction to free respiration, the patient is very likely to perish subsequently from exhaustion, or blood poisoning, or from pneumonia or other lung complication.

Treatment.—The use of the ice-bag externally, and swallowing small pieces of ice seems to afford marked relief. I have derived most benefit from a hot pack to the neck. If suffocation persistently threatens, the edematous parts should be scarified, first spraying the throat with cocaine, and employing a curved bistoury wrapped with adhesive plaster to within one third of an inch of the point. Unless this affords prompt relief, tracheotomy should be performed immediately.

Apis (3x) is the remedy above all others, and usually the only one required. Dr. J. S. Mitchell prefers *Arsenicum* (3x), but considers *apis* effective when there is soreness and stinging, and when the parts are not only puffy but glossy. He says of *Arsenicum* that "it especially covers the low tone of the organism which is incident, and it directly affects the edema; it promotes the absorption by restoration of tissue-force, and its action is generally prompt." He also recommends *Lachesis* when there is a livid mucous membrane, and the suffocative attacks are very urgent. Dr. Thos. Nichol advises the use of *Sanguinaria*. *Iodine* (2x), *Kali iod.* (1x) and *Rhus.* (3x) should also be consulted.

SPASM OF THE LARYNX.

Synonyms.—Laryngismus Stridulus, Spasmodic Laryngitis, Spasm of the Glottis, False Croup, Child Crowing.

Definition.—A disease peculiar to infants and young children, purely of a nervous character without any inflammation of the larynx, and consisting of a spasmodic closure of the glottis, causing dyspnea with a crowing inspiration and arrest of breathing. A variety known as spasmodic laryngitis or spasmodic croup is associated with a mild catarrhal laryngitis.

Etiology.—The disease attacks only children, more often during infancy, never after the third year. Spasmodic croup occurs mostly between the second and fifth years. It occurs oftener in boys than in girls, and especially in rachitic subjects. It may be excited by fits of passion or great emotion, and may be associated with tetany. Spasmodic croup which is essentially the same condition, may accompany a mild laryngitis, and result from similar causes.

Symptoms.—Two clinical varieties are recognized: (1) Laryngismus stridulus; (2) Spasmodic laryngitis.

1. *Laryngismus Stridulus.*—This type is purely nervous in its character, and is not associated with any inflammatory condition of the larynx. The attack consists of a sudden arrest of breathing, the child struggles for breath, and becomes cyanotic, and the pulse weak and flickering. After a few seconds the spasm passes off, inspiration takes place with a loud crowing sound, and the attack is over. There is neither cough, fever nor hoarseness. Sometimes general convulsions occur. The attacks may be repeated several times within twenty-four hours, or occur at longer intervals, being easily excited by reflex causes.

2. *Spasmodic Laryngitis.*—This variety, usually known as spasmodic croup, results from exposure to cold, being associated with mild catarrhal laryngitis. The attacks always come on in the night, usually between twelve and one o'clock. The child awakens suddenly from a sound sleep, sits up in bed, with great dyspnea and anxiety. The voice is hoarse, the inspirations noisy and stridulous, and there is a ringing, brassy, croupy cough. The patient may become cyanotic and the condition appear alarming, but the attack passes off in from a few minutes to an hour, and the child again goes to sleep. There is no fever or other disturbances such as are present in catarrhal croup. The attacks may recur for two or three nights, but usually in such cases there are some fever and catarrhal symptoms.

Diagnosis.—Both varieties may be mistaken for membranous or diphtheritic croup, but it would seem that such a mistake was inex-

cusable, the spasmodic character of the attack being so plain that no error should occur. The *prognosis* is decidedly favorable, notwithstanding the alarming appearances of the patient.

Treatment.—The child should be quickly placed in a hot bath, and at the same time the head and chest should be sprayed with cold water. This will usually break up the spasm at once. The patient may also inhale nitrite of amyl, chloroform, or aromatic spirits of ammonia. Steam inhalations often give prompt relief. If there are any sources of reflex irritation, they should be corrected. If the gums are swollen and hot, they should be lanced. If the stomach is loaded with indigestible food, an emetic should be administered. In extreme cases the faradic current may be applied, the positive pole to the spine and the negative pole at the hypogastrium.

Any dyscrasia should receive careful attention between the paroxysms, and the tone of the nervous system should be improved by hygienic and dietetic measures. To prevent a recurrence of the attack *Gelsemium* is the most efficient remedy. Arndt considers *Moschus* (1x) as "the remedy par excellence." Also, consult *Cuprum* (3x), *Hyos.* (2x), *Bell.* (2x), *Chlorine* (3x), *Ignatia* (3x) and *Sambucus* (1x).

III. DISEASES OF THE BRONCHI.

ACUTE CATARRHAL BRONCHITIS.

Synonyms.—Acute Bronchitis, Acute Tracheo-bronchitis, Acute Bronchial Catarrh, "Cold on the Chest."

Definition.—An acute catarrhal inflammation of the whole or any part of the mucous membrane of the bronchial tubes. This includes also true "capillary bronchitis" without involvement of the bronchioles. When the latter are involved, there is always an extension to the alveolar structure. Such cases constitute and are properly described as "broncho-pneumonia."

Pathology.—The lesion is bilateral, affecting the trachea and the larger and medium-sized bronchi. In severe cases, especially in children and old people, the smaller bronchi may be involved. The mucous membrane is congested, reddened, swollen, and covered with mucus and muco-pus containing desquamated epithelial cells and leucocytes. The mucous glands are enlarged. In severe cases the submucosa is edematous and is infiltrated with leucocytes.

Etiology.—Tracheo-bronchitis is rarely a primary disease, but usually results from extension of a catarrhal inflammation of the upper air passages caused by "catching cold." It occurs most often in chil-

dren and old people, and is most common in the winter and early spring and in climates characterized by sudden and extreme weather changes, especially with humidity. Some individuals are particularly susceptible, and suffer from attacks of tracheo-bronchitis on very slight exposure. Those who lead an indoor life, with poor ventilation are most susceptible. It may occur epidemically and almost always accompanies an attack of influenza. It may occur secondarily in many diseases, especially the exanthemata (notably measles) and acute infectious diseases, especially typhoid fever. The disease may also be caused by irritating vapors and noxious gases, as from acids or other chemicals, and by continually inhaling smoke or dust as in factories.

Symptoms.—In adults the invasion is marked by chilliness and some fever, and the usual symptoms of a "cold." Soon there develops a tightness and oppression of the chest, a raw, scraped feeling under the sternum, cough and increased frequency of respiration. At first the cough is dry, hoarse and painful, coming in distressing paroxysms. Pain in the chest during coughing is chiefly felt along the attachments of the diaphragm and down the sternum. When secretion is established, the cough is much relieved. The sputum is at first scanty and mucous in character; it may be blood-streaked; later it becomes more abundant and muco-purulent. Dyspnea is not a regular feature of bronchitis of adults, although in some patients there may be asthmatic breathing.

Inspection, palpation and percussion yield negative results. Auscultation reveals a harsh respiratory murmur and sometimes sibilant and sonorous râles, while later mucous râles may be detected. In infants there may be only fever, hacking cough and hurried respiration, while in older children the symptoms as described for adults may be more or less present. In young and feeble children there may be convulsions at the outset. The temperature usually rises as high as 102° to 103° F., with morning remissions, the pulse is rapid, the respiration rapid and sometimes inefficient as shown by the mild cyanosis resulting with marked drowsiness. At this stage marked subcrepitant râles are heard which are of great diagnostic value, and bronchial fremitus is usually present. In such cases there is involvement of the capillary tubes, and the condition is commonly known as "capillary bronchitis." If the secretion in the tube continues to increase, the respiration becomes exceedingly rapid, from 60 to 80 per minute, but if the disease progress toward a fatal termination, both respiration and pulse fall, and the temperature may drop to below normal. At the same time the cyanotic symptoms increase, there is great restlessness, weak pulse, cold, clammy sweat, stupor and even coma. In these cases the

bronchioles and adjacent alveoli are frequently involved, constituting a broncho-pneumonia, and as such most severe cases of capillary bronchitis should be regarded.

In old people bronchitis has a tendency to involve the smaller tubes. Prostration comes on early, and is extreme. The patient being too weak to expectorate, the accumulated mucus can not be got rid of, while the respiration is at the same time so weak that the subcrepitant râles present in children are not generated. Frequently broncho-pneumonia develops.

Diagnosis.—The diagnosis is usually made without difficulty. If broncho-pneumonia develop, the dyspnea and fever increase and the general state of the patient is more portentous, while auscultation yields a broncho-vesicular murmur, and there is dullness on percussion over the affected spots. Acute bronchitis may precede pulmonary tuberculosis, and care should be taken to eliminate this latter disease. It is more apt to be present when the bronchitis involves the apex. If at the same time, the finer tubes are involved and there is a continuous high temperature, miliary tuberculosis may be present. Repeated slight hemorrhages suggest tuberculosis. Frequent attacks of bronchitis in young children are also suggestive of tubercular trouble.

Prognosis.—As a rule, the prognosis is favorable except in old people, young children, and others debilitated by constitutional disease, especially tuberculosis, gout or rheumatism. Capillary bronchitis is always a grave disease, and attended with great danger, though most cases recover, even after the condition seems hopeless. Bronchiectasis may result from gravitation of the imperfectly expectorated bronchial secretions.

“In young children this downward extension of the affection, with resulting broncho-pneumonia and areas of collapse, in consequence of dilatation and occlusion of the bronchioles by muco-pus, is a not uncommon and serious event.” (Anders.)

Treatment.—The general treatment of an attack of acute bronchitis in the early stages consists chiefly in keeping the patient in a warm room, entirely protected from cold or dampness, though the air of the room should be slightly moist. If the symptoms are severe, the patient should be put to bed and kept there until the disease is under control. Steam inhalations are of benefit. They may be medicated with glycerine, eucalyptus, tar or other soothing drugs if desired. If there is much soreness in the chest, hot poultices should be applied. Patients showing a susceptibility to bronchitis should be warned not to keep their living rooms too warm, and advised to douche the upper part of the chest and the throat every morning with cold salt water followed

by a brisk rubbing with a coarse towel. Mufflers and all throat wraps should be gradually discarded. Flannel should be worn next the skin most of the year.

In capillary bronchitis the general treatment is about the same as already stated, save that poultices do more harm than good. I use a light quilted cotton jacket. In these cases it is especially important that a nourishing liquid food be given regularly, and in nursing infants the hour for nursing should not be neglected.

Therapeutics.—In the first stage **Aconite** (2x) is the remedy most often required. Chilliness, high fever, dry cough, hot, dry skin and restlessness are the chief indications. It is most useful in cases arising from checked perspiration, but is always useful if it is well indicated.

Ferrum phos. (3x) will answer an excellent purpose, especially in children, if the high fever and restlessness of aconite are absent.

Gelsemium (2x) may be useful if there is much aching of the head, back and limbs, soft flowing pulse, languor, and general symptoms of an influenza.

Bryonia (2x).—This drug is oftenest required immediately after the first stage, when the symptoms of invasion have become modified and the disease has just localized, or is about to localize, in the trachea and larger bronchial tubes. Of little value in capillary bronchitis. The cough is developing, and is usually dry and rough, with a little thin mucous expectoration, and accompanied with considerable soreness of the chest. The cough hurts the head and distant parts of the body. The cough is always worse in a warm room and from motion.

Phosphorus (3x).—This drug follows Bryonia well, and is usually indicated after the latter drug has ceased to be indicated. The cough is dry, caused by tickling in the trachea, some mucous expectoration, and accompanied by soreness, oppression and constriction of the chest, the latter being an important differentiating symptom. The cough is usually worse when the patient lies on the left side, worse from talking, laughing or reading, and, contrary to Bryonia, is better indoors and worse when going from warm to cold air.

Rumex (2x).—This remedy is of great value in tracheo-bronchitis. Its chief feature is that cough is always produced by tickling in the throatpit, and has invariably associated with it a raw sensation behind the sternum. Under such circumstances its effects are marvelous. The cough is generally incessant and fatiguing, and is aggravated by pressure, talking, and especially by inspiring cold air, and in the evening after lying down.

Tartar emetic (3x).—This drug may be useful in simple bron-

chitis, but it is the remedy above all others, and almost always indicated in a typical case of capillary bronchitis. Its chief indication is a great accumulation of mucus in the chest, causing rattling respiration and suffocation even to cyanosis. There is oppressed breathing, rapid pulse, nausea, vomiting and drowsiness. I generally employ the third trituration, but the second sometimes answers better. According to Goodno, the *Arsenite of Antimony* in the second trituration has succeeded after the tartrate has failed.

Ipecac (3x).— This remedy is useful in all bronchial catarrhs, but especially valuable in capillary bronchitis, its symptoms being similar to those of *Tartar emetic*, except that the rattling of mucus is not quite so obvious, and there is less prostration, drowsiness and tendency to collapse.

Hepar sulph. (3x).— This is the chief remedy in tracheo-bronchitis when the cough is loose. With the looseness there is some rattling, but not to the same extent as in ipecac or tartar emetic, where the air passages are so full of mucus that there is a constant rattling sound during inspiration and expiration, which is not present in Hepar. Neither is there the same constant tendency to vomiting of mucus, oppression of breathing and cyanosis. In Hepar the cough is often brought on from being uncovered, or any portion of the body becoming cold. It is very characteristic that the hepar patient is very sensitive to cold air, and has a tendency to easy and profuse perspiration.

Kali bichrom. (3x).— This drug is of great value in all forms of bronchitis, if well indicated. The cough is usually dry, deep, rough, hoarse, and accompanied by a difficult, tough, stringy mucous expectoration. Kali is often needed for the hard, deep coughs that prevail after a common cold. While the tightness and constriction of phosphorus are not present, yet there is no element of looseness in the cough itself, wherein it differs from hepar sulphur. The cough is usually brought on by tickling in the trachea or at the bifurcation of the bronchi, and according to clinical observations, is worse after eating, when undressing, and in the morning on waking; better after getting warm in bed and when exercising.

Stannum (6x).— Stannum is an invaluable remedy where there is an easy, profuse mucous or muco-purulent expectoration, which is usually of a greenish color. It is easily differentiated from tartar emetic by the fact that while there is a great accumulation of mucus, it is usually located in the trachea, does not cause any great amount of, if any, rattling, and is very easily expectorated. Neither does it cause the cyanotic symptoms of the latter, and is not accompanied by vomiting and nausea. An almost ever-present characteristic is a great weakness

in the chest. The expectoration of balls of sweetish mucus is also characteristic. Stannum is oftener indicated in subacute and chronic tracheo-bronchitis.

Belladonna (3x).—Particularly useful for young children. In addition to the general well-known indications for the drug, there is a dry cough caused by tickling in the larynx. Worse when lying down. Dry cough during sleep that does not awaken the patient.

Also consult *Sticta* (1x), *Senega* (1x), *Cactus* (3x), *Dros.* (2x), *Iodine* (2x), *Lachesis* (6), *Bromine* (2x), *Hyos.* (3x), *Merc. cor.* (3x), *Puls.* (3x), *Rhus* (3x) and *Sang.* (1x).

CHRONIC BRONCHITIS.

Definition.—A chronic catarrhal condition of the mucous membrane of the bronchial tubes associated with more or less inflammation of the muscular structures.

Pathology.—The mucous membrane of the bronchi may be thinned, and the muscular and glandular coats may be either atrophied or thickened and granular. There may be superficial ulcerations. Bronchial dilatation is not uncommon. Emphysema is usually present.

Etiology.—Chronic bronchitis occurs mostly in elderly people, though the young and middle aged may suffer with it. It occurs oftenest in cold weather, frequently recurring every year as the cold weather comes on, and lasting until settled warm weather in the late spring. It may occur primarily from exposure to cold or irritating dust or vapors, but is usually secondary, either to repeated attacks of acute bronchitis, or more often to gout and rheumatism, or, at least, it is most apt to occur in gouty or rheumatic subjects. It may result secondarily from emphysema, any chronic inflammation of the lungs, pleural adhesions, chronic heart disease, Bright's disease or chronic alcoholism.

Symptoms.—The symptoms resemble those of acute bronchitis somewhat modified. There may be substernal pain, but it is not so well marked, and is more often only a sense of constriction. Cough and expectoration are the most prominent symptoms. The former is not constant, but occurs in paroxysms, and varies greatly in frequency and severity. The expectoration also varies widely in quantity and character. Sometimes there is little or no expectoration (dry catarrh), and in other cases it is profuse and sero-mucous or semi-purulent in character. This form is known as bronchorrhea. Another clinical variety known as winter cough, usually occurs in the aged and those of a gouty diathesis, and is associated with emphysema and cardiac disease. In these cases the cough occurs in paroxysms worse at night

or early in the morning, and is accompanied by free expectoration of the secretion that has accumulated during the night. In fetid bronchitis the expectoration has an odor resembling that of decomposing animal matter, which results from a decomposition of the bronchial secretions. This may occur in simple bronchitis, but it is more often present in bronchiectatic cavities, in tubercular cavities, with abscess and gangrene of the lung, and empyema with a pulmonary fistula. When occurring in chronic bronchitis, fetid expectoration may lead to bronchiectasis, pneumonia or pulmonary gangrene. Anders lays stress upon the necessity of excluding all diseases that may give rise to fetid expectoration before making a diagnosis of bronchitis. "In the latter disease the expectoration is usually copious, and on standing, separates into three layers, of which the uppermost is composed of frothy mucus, the intermediate of a serous liquid, and the lowest of a thick sediment, that presents a granular appearance, and is made up chiefly of small yellow masses — the so-called Dittrich's plugs. These plugs are characteristic of fetid bronchitis, and are the cause of the fetor."

Diagnosis. — The diagnosis of simple chronic bronchitis is usually an easy matter, but it is more difficult to establish the presence and character of complicating causes. The most common complication is pulmonary tuberculosis. In this disease there is the usual history of tuberculous disease, there is fever and loss of flesh and strength, usually physical signs of localized consolidation, especially in the apex, and the sputum contains the tubercle bacillus. Emphysema, abscess and gangrene may also require differentiating, which is generally accomplished without great difficulty by carefully noting the presence or absence of the symptoms and physical signs characteristic of these diseases.

Prognosis. — The prognosis as to a complete cure is not favorable, yet the disease is amenable to treatment, and in my opinion is often practically cured, though exciting causes may give rise to subsequent attacks. When the disease is secondary to, or associated with, other diseases, the prognosis depends mostly upon the primary conditions. Severe cases may give rise to emphysema, bronchiectasis and even cardiac disease. The course of chronic bronchitis is very protracted, often lasting for many years, with more or less frequent acute exacerbations from climatic changes. Osler says that metastatic brain abscesses have followed the fetid variety.

Treatment. — Climatic treatment, when possible, is of the utmost importance. Patients should be sent to a warm, dry climate during the winter months. Southern California, Southern Georgia and New Mexico, are among the most suitable resorts in this country. Dry

catarrh does better in a warm, moderately moist climate, such as Florida. If to the warm, dry climate can be added an atmosphere impregnated with the balsamic vapors of pine, it is all the better. Those unable to avail themselves of a change of climate should be careful to avoid any exposure in cold, damp, inclement weather, remaining indoors if possible. They should, however, in pleasant weather, spend much time in the open air and sunshine, protected during all seasons of the year with flannel worn next to the skin. The sleeping-rooms should be well ventilated, but free from draughts of air. Cold sponging of the chest every day followed by friction is a valuable adjunct. Alcoholic liquors should be avoided unless temporarily indicated. The diet should be nourishing and easily digested. Various sprays and inhalants have been recommended, but are of little service. I have used beechwood tar, iodol, eucalyptol, carbolic acid, and other similar preparations by means of a hot-air inhaler with much benefit, especially in fetid bronchitis. Steam inhalations are not good except during an acute attack, or sometimes in dry catarrh. As a palliative for the distressing cough, chloroform may be given by inhalation, or in drop doses on sugar. Glycerine is also valuable. Syrup of tar or wild cherry will often relieve. The use of the indicated remedy will usually avoid the necessity for using opiates, which are ultimately harmful and should never be employed when it is possible to avoid it. Medicinal treatment must be purely symptomatic, and the selection of the remedy will depend largely upon the character of existing complications. In addition to the remedies, for which indications have already been given under acute bronchitis, and which are of equal service in the chronic variety, I would also mention the following: *Ars. iod.* (3x), *Arsen.* (3x), *Iodine* (3x), *Drosera* (2x), *Grindelia* (1x), *Spongia* (3x), *Verbascum* (1x), *Bromine* (3x), *Sang.* (2x), *Caust.* (3x to 30x), *Am. carb.* (30x) (bronchorrhea), *Hyos.* (3x), *Kali carb.* (6x), *Kreos.* (3x) (fetid bronchitis), *Silicea* (6x), *Sulphur* (30x). Also consult treatment of pulmonary tuberculosis.

FIBRINOUS BRONCHITIS.

Synonyms.—Croupous Bronchitis, Plastic Bronchitis, Membranous Bronchitis.

Definition.—An acute or chronic catarrhal inflammation of the bronchial mucosa characterized by the formation of a croupous exudate similar to that found in other croupous inflammations of mucous membranes, though perhaps more dense. The exudate is expectorated in casts the shape of the bronchi, the larger casts being hollow, and the smaller ramifications solid.

Etiology.—The disease is rare, and we know little as to its causes. It occurs oftenest in males, and between the twentieth and fortieth years of age, and is most frequent during the spring months. It may result primarily from inspiring irritating vapors and steam, but is more often secondary to other diseases, especially to membranous laryngitis, where it occurs by a downward extension.

Symptoms.—The acute form usually presents a brief history of acute catarrhal bronchitis, severe dyspnea soon supervening, followed by paroxysms of cough resulting finally in the expectoration of the fibrinous casts, with more or less hemorrhage and either temporary or permanent relief. In some cases the attack follows a membranous laryngitis. In case the exudate is not expectorated, the dyspnea becomes more urgent, cyanotic symptoms develop, and finally asphyxia. In the chronic form there is usually a history of chronic bronchitis, after which at irregular intervals of weeks or months, there is recurrence of paroxysms of violent cough ending in the expectoration of fragments of fibrin or casts. Sometimes the attacks recur regularly. Anders mentions a case where these attacks recurred once annually.

The physical signs consist of bronchial râles of all kinds, fine and coarse, with sibilant and sonorous breathing. When a bronchus is occluded, breathing sounds may be absent over that portion of lung, returning, however, when the occluding membrane is coughed up.

Diagnosis.—The presence of the fibrinous casts is the only diagnostic feature. The nature of the exudate must be determined in order to exclude diphtheria, which is usually a comparatively easy matter, by taking into consideration the history of the case and examining the exudate to establish the absence of the Klebs-Löffler bacillus. A careful examination should also be made for other lesions such as bronchopneumonia or pulmonary tuberculosis.

Prognosis.—The acute variety offers a doubtful prognosis, but the chronic form rarely results fatally, though often persisting for many years. Complications have a decided influence on the prognosis. The chronic form may lead to pneumonia, or foreshadow pulmonary tuberculosis.

Treatment.—The treatment is practically the same as that laid down for acute catarrhal bronchitis supplemented with that for membranous laryngitis. *Kali bichrom.* is the most important remedy, but other remedies previously mentioned for the diseases named must be carefully consulted.

BRONCHIECTASIS.

Definition.—A general or circumscribed dilatation of the bronchial tubes.

Pathology.—A *cylindrical* and a *sacculated* form of bronchiectasis is recognized. The two forms may co-exist in the same lung. The dilatation varies in size from a pea to that of a small orange. Sacculated dilatations are usually multiple, being spread along the course of a bronchus. A single sacculated bronchiectasis surrounded by non-indurated lung tissue may occur with emphysema and bronchitis in rare instances, and may resemble a single cyst without contents. The bronchial wall is thinned and its constituent elements are atrophied. The mucous membrane constituting the lining of the cavity may be normal or smooth and glistening, the columnar having been replaced by pavement epithelium, or it may be infiltrated and thickened, or it may be extensively ulcerated, especially in cases where the secretions are retained. The contents of some of the larger cavities are often exceedingly fetid, and a general fetid bronchitis may complicate the disease.

Etiology.—Unless congenital, which is extremely rare, bronchiectasis is always secondary to other respiratory diseases, chiefly chronic bronchitis, less often emphysema, broncho pneumonia of children, phthisis, foreign bodies within the bronchi, or pressure from an aneurysm or a tumor. These diseases weaken the bronchial structure and lead to atrophic changes. The structure of the tube may also be weakened by traction exerted from without as in old pleuritic adhesions, interstitial pneumonia and fibroid phthisis.

Most of the symptoms in bronchiectasis are due to the primary lesion. Outside of the character of the cough and expectoration there are no symptoms of diagnostic import. The cough occurs in paroxysms at more or less lengthy intervals during which the dilated tubes have filled. Usually the paroxysms occur in the morning on rising, but they may also be brought on by any position of the body that allows the secretion to flow from the dilatation into a normal tube. The sputum is abundant, frequently is foul-smelling, and separates on standing, into three layers—the upper of a brownish froth, the middle of watery mucoïd substance, and the lowest of a thick sediment of granular matter and cells.

Diagnosis.—The physical signs are neither constant nor diagnostic, varying in character according to size and location, and also according to the condition of the contiguous lung substance. Very often sacculated dilatations near the surface give signs simulating those present in

phthisical cavities, but they are usually found at the base of one or the other lung. The cavernous signs also vary with the amount of accumulated secretions which does not occur with the tuberculous cavities. Then, too, there is an absence of the usual history of tuberculosis with hacking cough, hemoptysis, progressive loss of flesh and strength, neither is the tubercle bacillus found in the sputum. The physical signs may closely resemble a sacculated empyema with an opening into a bronchus, but the history of the case will usually make the diagnosis evident.

Prognosis.—The prognosis, apart from the primary lesion, is quite favorable as to life, but the course is protracted, often lasting for many years, the patient meanwhile enjoying a fair degree of health.

Treatment.—Bronchiectasis being a permanent organic lesion, is not amenable to treatment other than, in a measure, palliative. Sedative medicines should not be employed, as expectoration should be encouraged rather than suppressed. Antiseptics may be used internally and by inhalation to overcome the fetor. *Kreosote* in a low dilution internally and *Carbolic acid* by inhalation are the best remedies for this purpose. *Eucalyptol* may be used as an inhalant. *Stannum* (6x) and *Silicea* (6x) are the remedies best suited to most cases, but the medicinal treatment must, as a rule, be based upon the symptoms arising from the primary disease.

ASTHMA.

Synonym.—Bronchial Asthma.

Definition.—A neuropathic disease characterized by paroxysms of dyspnea due to contraction of the circular muscular fibers of the bronchi. There may also be contraction of the respiratory muscles, and more or less hyperemia of the bronchial mucous membrane.

Etiology.—The causes are predisposing, exciting and reflex.

Predisposing Causes.—The disease is about twice as frequent in males as females. Excluding hay-asthma, it is more common in the winter and early spring.

Heredity is noted in about 50 per cent of the cases. As a rule running in neurotic families, being often associated with epilepsy and neuralgia in other members of the family, and sometimes alternating with these diseases in the same individual.

Exciting Causes.—Attacks of asthma may be excited by damp, cold weather, and the disease prevails mostly in climates characterized by cold, dampness and sudden changes. Such patients find relief at once on removing to a high, dry atmosphere, such as is found in mountainous regions. Some cases are relieved at once by any change

of climate. Attacks are frequently excited by the inhalation of irritating dust, vapors, smoke or fog. Like hay-asthma they may be brought on by inhaling ipecac, sulphur, iodine or the pollen of various flowers and grasses, or smelling the odor of violets, roses or strawberries, or the emanations of certain animals. Sudden mental shocks and deep emotions may induce asthma. The most frequent cause of an attack in those predisposed to asthma, is bronchitis, and if, in such patients, bronchitis can be avoided, attacks of asthma are rare.

Reflex Causes.—Nasal polypi and other obstructive diseases of the nasal cavities; gastric disturbances; uterine and ovarian diseases; rectal disease; certain skin diseases; cardiac disease; emphysema; gout; rheumatism; syphilis; Bright's disease.

Symptoms.—Prodromes may be present, such as lassitude, tightness of the chest, etc., but as a rule the attack comes on abruptly while the individual is enjoying his ordinary health, and more often occurs in the night, awakening from a sound sleep. The attack consists in a paroxysm of dyspnea, which at its height, becomes very distressing. The patient can not lie down, but must sit or stand, and have a free supply of fresh air. Every respiratory muscle is put into active use in the violent and frantic efforts to maintain respiration. Inspiration is spasmodic, and the expiratory effort long, difficult and wheezy. The face is pale and distressed, covered with cold perspiration, the lips, eyelids, and finger-tips livid from cyanosis, the temperature subnormal, the pulse rapid and feeble. The attack may last from a few minutes to several hours, and then pass off, sometimes recurring every night for several nights, especially when associated with chronic bronchitis. With the attack, there is a cough at first tight, but growing looser, and, at the close of the attack, resulting in the expectoration of gelatinous masses and muco-purulent sputum. The former unrolled in water shows mucous casts of the smaller bronchi. They frequently have a distinct spiral form, and they are known as "Curschmann's spirals," in which there is frequently a central translucent filament composed of altered mucin. In addition are found in the sputum the pointed octahedral crystals described by Leyden, identical with those found in semen and in leukemic blood.

"On inspection the thorax looks enlarged, barrel-shaped, and is fixed, the amount of expansion being altogether disproportionate to the intensity of the inspiratory movements. The diaphragm is lowered and moves but slightly. Inspiration is short and quick, expiration prolonged. Percussion may not reveal any special difference, but there is sometimes marked hyperresonance, particularly in cases which have had repeated attacks. On auscultation, with inspiration and expi-

ration, there are innumerable sibilant and sonorous râles of all varieties, piping and high-pitched, low-pitched and grave. Later in the attack there are moist râles." (Osler.)

Diagnosis.—There is no difficulty in establishing a diagnosis of asthma, but it is often quite difficult to establish the cause or diagnose a coexisting disease. Spasm of the larynx is often mistaken for asthma, but the presence of huskiness of voice and aphonia, the difficulty of inspiration rather than expiration, and the absence of the physical signs of asthma are sufficient for differentiation.

Prognosis.—The prognosis as to life is most favorable. No matter how alarming the paroxysm may appear, death never results, except it be due to an associated disease, especially emphysema or cardiac disease. Hopes of recovery depend largely upon the nature of existing complications. If there are none, proper treatment, including change of climate, will often effect an apparent cure, though I think such "cured" patients are always liable to a recurrence under certain etiological conditions.

Treatment.—The first element in treatment is the immediate relief of the paroxysm. This requires a relaxation of the contracted bronchi, for which a multitude of remedies have been recommended. Probably the most accessible and efficient method consists in the hypodermic injection of *morphia* ($\frac{1}{4}$ to $\frac{1}{2}$ gr.) and *atropin* ($\frac{1}{160}$ gr.). However, the continued administration of an opiate may establish, especially in neurotic subjects, the morphine habit, and must, therefore, not be used indiscriminately. Next in efficiency is *Amyl nitrite*, a *perle* containing from two to five minims, being broken in a handkerchief and the vapor inhaled. Hot stimulants or spirits of chloroform in hot water may be given, while whiffs of chloroform may be required in aggravated cases. Sometimes a pint of hot, strong coffee, without cream or sugar, will arrest the attack, and is at all times the best stimulant if one is needed. Alcohol, when given hot, and in sufficiently large doses to induce mild intoxication, may be found very useful; and by adding to "hot toddy" a dose of spirits of chloroform, an efficient combination is the result. Smoking stramonium leaves, or, inhaling the fumes of potassium nitrate or chlorate are popular and efficient methods. Cigar smoke sometimes relieves. Chloral hydrate in ten- or fifteen-grain doses often affords relief. According to Hale, lobelia in ten-drop doses every half hour will certainly shorten the duration of the paroxysm. He used the following formula:—

℞. Tinc. lobelia. drm. j.

Chloroform water. oz. j.

Give a teaspoonful every half hour or oftener until relieved.

Having relieved the immediate sufferings of the patient, the next and equally important element in treatment consists in trying to prevent a recurrence of the attack. In the first place a very careful and systematic physical examination should be made in order to discover, if possible, any existing cause, and if such be found, prompt efforts be instituted for its removal. If the case be purely neurotic or due to bronchitis, a change of climate should be advised, but to select the proper climate for each case is not always an easy matter. Cases originating east of the Mississippi River are usually cured by removing to the plains of Nebraska, Colorado or Wyoming. During my practice in Nebraska I saw some cases originating in that country, that only obtained relief by going to Florida, Southern Georgia or to the seashore. Some find great benefit from the climate of northern Michigan. Some patients are only comfortable while on an ocean voyage. There is no known rule for determining the choice of locality.

In all cases an outdoor life, systematic exercise, living in light, well-ventilated apartments, good nourishing food, regular habits, regular cold sponge baths, and other efforts to improve nutrition and the general tone of the system are absolutely essential to successful treatment.

Therapeutics.—*Arsen.* *Ipec.*, *Grindelia*, *Moschus* and *Lobelia* are the chief remedies.

Arsenicum (2x).—Paroxysms after midnight; obliged to sit up at once and to bend forward; very restless but made worse from motion; also aggravated by warmth, and during stormy weather; dry, hard paroxysms of cough, followed by expectoration of frothy mucus, streaked with blood. Burning pain in the chest; profuse perspiration; great prostration. "In the dry asthma and in the asthma of old people, it is especially valuable." (Mitchell.)

Ipecac (2x).—Violent constriction of the throat and chest, with shortness of breath and *wheezing* respiration; gasps for air at the open window; face pale; worse from least motion; threatened suffocation; vomiting gives relief; rattling of mucus when breathing and coughing, but none is expectorated.

I once treated a case that resisted the most carefully selected remedies. I gave *Ars.* 2x and *Ipecac* 2x in combination with remarkably beneficial effects, the patient depending entirely upon this preparation for years and until her death, which occurred recently.

Grindelia.—This drug is used by all schools of practice for asthma, and by many it is considered a specific. The old school uses a teaspoonful of the fluid extract. I generally use the tincture in five-drop doses. According to J. S. Mitchell, it is indicated for "attacks of

nervous asthma, when the paroxysms are severe, dyspnea great, expectoration at first scanty, afterward becoming looser, with considerable mucus thrown off." According to Hale, "The paroxysms occur between midnight and 2 A. M., and last several hours, and are attended by a severe convulsive cough. To make matters worse, the action of the heart becomes weak and irregular, and this feebleness of the circulation increases the distress of the patient. There is no structural disease of the heart in such cases, but the functions of the cardiac center in the medulla are depressed. It has one symptom of importance, a 'key-note' which leads to its selection: 'A fear of going to sleep on account of loss of breath, which awakens him.'"

Lobelia (1x).—*Extremely difficult breathing*, caused by constriction of the chest, accompanied by nausea, vomiting, and great prostration. Mitchell says, "Asthma aggravated from exertion, by indigestion attended with weakness in the stomach, pressure on the epigastrium, attack preceded by prickling all over, extending even to the fingers and toes; dyspnea urgent and sudden, can not bear the slightest exposure to cold."

Moschus (2x) is invaluable when the neurotic element predominates, especially if hysterical symptoms are present. The chest seems filled with mucus, causing fine sibilant râles throughout. The patient is in great fear of impending suffocation. There is sense of intense constriction in the chest.

Nux vomica (3x).—For irritable persons who are accustomed to drinking coffee or liquor. After the subsidence of an attack, the tongue exhibits a thick, yellow coating. There is a feeling of fullness in the stomach, with belching, and constipation. As Dr. Russell says of it, there remains a sort of physical memory of the struggle, and the patient feels that no liberties must be taken, either of diet or exercise. If the attack began with sneezing and fluent coryza, or if vapors of copper or arsenic started it, or if it is merely spasmodic, in consequence of a hypersensitive pneumogastric, Nux and Strychnia are most useful remedies. At times, both Nux and Arsenicum are prescribed in chronic cases, the first-named at night, the other in the morning. (Crawford.)

Tartar emetic (3x).—Respiration short, rapid, heavy, anxious, difficult, must be supported in a sitting posture in bed; at 3 A. M.; in the evening; better from cough and expectoration; *rattling of mucus in chest*, rapid pulse, nausea, vomiting, and drowsiness. Sometimes this accumulation of mucus in the chest threatens suffocation, and cyanotic symptoms become manifest. In all cases the patient is at once relieved if he succeed in expectorating, or if vomiting occur.

Pulmo vulpis (3x).—Von Grauvogle recommended this drug for the asthma of old people, with profuse expectoration.

Aconite (3x).—This remedy is especially useful where the attacks are violent, and occur in plethoric, robust persons. The attacks come on in the early evening, with heat, restlessness and profuse perspiration; full bounding pulse, and expectoration blood-streaked, with palpitation of the heart. "The worst case of asthma which I ever encountered, and which had existed for several years, yielded quite promptly to Aconite 3d. The patient was a strong, vigorous adult, and the attack characterized by intense violence." (Mitchell.)

Consult also *Ambra* (6x), *Aralia* (2x), *Bell.* (3x), *Brom.* (3x), *Cuprum* (3x), *Hydrocyanic acid* (3x), *Lach.* (6), *Opium* (30x), *Samb.* (2x), *Sang.* (2x), *Stan.* (6x), *Sulph.* (30x), *Tab.* (2x.)

IV. DISEASES OF THE LUNGS.

CONGESTION OF THE LUNGS.

Synonym.—Hyperemia of the Lungs. Congestion of the lungs may be either (1) active or (2) passive.

(1) **Active congestion.** **Etiology.**—Active congestion of the lungs may occur from exposure to cold when overheated or after severe exertion. In such cases it is often rapidly fatal. It may also occur from the inhalation of hot or highly irritating vapors and by violent exercise. It more often occurs as secondary to, and associated with, inflammatory diseases of the lungs — pneumonia, pleurisy, bronchitis and tuberculosis.

Symptoms.—Rapidly difficult breathing, slight cough with a little frothy, bloody expectoration, and a moderate degree of fever. The physical signs are diminished vesicular murmur and increased bronchial sounds and impaired but not dull percussion note. The course is brief, either terminating in death or recovery within a short time or developing pneumonia.

Treatment.—The general treatment is the same as in the first stage of pneumonia. The remedy is usually either *Aconite* (2x) or *Verat. vir.* (1x). Also consult *Ferr. phos.* (3x) and *Belladonna* (2x).

(2) **Passive congestion.**—Two forms are recognized: Hypostatic and Mechanical or Obstructive.

Hypostatic Congestion is found usually at the posterior portion of the bases of the lungs. It occurs commonly in those long confined to a dorsal position of the body as a result of feeble circulation and gravita-

tion, especially in long-continued debilitating diseases and in old people. It is said to be especially pronounced in those suffering from cerebral hemorrhage. The affected portions of the lung are congested, edematous, heavy, imperfectly aerated, and frequently complicated with consolidated patches, the whole simulating a mild lobular pneumonia.

Symptoms are entirely absent, or, at most, very indefinite.

The **diagnosis** depends almost entirely upon the history of the case and the physical signs. Examination of the lower lobes show increased fremitus, slight dullness, diminished vesicular murmur, bronchial breathing and moist râles. In some cases cyanotic symptoms are present.

The **prognosis** depends entirely upon the character of the associated disease.

Treatment.—The posture of the patient should be changed, and the indicated remedy administered according to the symptoms of the primary disease.

For the hypostasis *Arnica* (2x) and *Rhus tox.* (3x) are chiefly to be considered.

Mechanical or Obstructive Congestion is also known as "Brown's Induration," and the "pneumonia of heart disease." It arises from an obstruction to the return of the blood from the lungs to the left heart such as mitral regurgitation or constriction or dilatation of the left ventricle. "The lungs are voluminous, russet brown in color, cutting and tearing with great resistance. On section they show at first a brownish-red tinge, and then the cut surface, exposed to the air, becomes rapidly of a vivid red color from oxidation of the abundant hemoglobin. So long as compensation is maintained, the mechanical congestion of the lung in heart disease does not produce any symptoms, but with enfeebled heart action the engorgement becomes marked, and there are dyspnea, cough and expectoration, with the characteristic alveolar cells." (Osler.)

The **treatment** must be directed to the condition causing the obstruction, and is therefore practically the same as that recommended for those diseases of the heart that have already been mentioned as causative factors.

PULMONARY EDEMA.

Definition.—An exudation of serum into the pulmonary interstitial tissue and the alveoli of the lungs.

Pathology and Etiology.—Localized edema of the lungs may arise as a result of congestion or inflammation or of new growths, infarcts or tuberculosis. This variety is known as "Collateral edema." When following hypostatic congestion, the condition is known as hypostatic

edema or splenization. General pulmonary edema is the result of stasis, occurring when the outflow of venous blood in the lung meets an obstacle that can not be overcome by the right ventricle, as in cardiac diseases, in which the left ventricle fails. It is often present during the death agony, being a symptom of approaching death. It is seen in the final stages of cachexias, profound anemia, acute and chronic Bright's disease, pneumonia, cerebral diseases and diseases of the heart. The lung tissue is swollen, and does not collapse when the chest is open. The elasticity of the tissue has disappeared, it has a boggy feel, and it pits upon pressure.

In collateral edema the color is red, but when congestion is not associated, the color is pale. On section a large quantity of frothy serum or sero-sanguinolent (in collateral edema) fluid flows over the cut surface.

Symptoms.—Dyspnea is always present, and is usually the most conspicuous symptom. The breathing being hurried, labored, and rattling, all the accessory muscles of respiration being called into action. The sense of oppression and anxiety is extreme. There is also a constant, harassing, short cough, and the expectoration is a blood-streaked, frothy mucus. The action of the heart may be tumultuous or feeble. The face is at first flushed, but as the left ventricle fails, or if the effusion into the air cells be sufficient to prevent the entrance of air, symptoms of cyanosis rapidly supervene, the pulse becoming feeble, the surface cold, the breathing shallow and hurried, the cough suppressed, stupor replacing the restlessness, soon deepening into coma. Percussion shows slight dullness over the affected portions of the lung. The respiratory murmur is feeble, and there may be diffused subcrepitant or large liquid râles, which are first and most distinctly heard at the basis of the lungs. Both sides are usually involved.

Diagnosis.—With the symptoms and physical signs above mentioned, edema of the lungs is usually readily recognized. There may be some danger of confounding edema with the first stage of pneumonia, but as the disease progresses, the course is so characteristic that it can not well be mistaken. In hydrothorax there are no moist râles, and the upper line of dullness changes with a change of position, which is not the case with edema.

Prognosis.—As a rule the prognosis is grave, though it depends largely upon pre-existing conditions. It sometimes, with great suddenness, and in chronic Bright's disease or cardiac disease, may prove rapidly fatal. Collateral edema, following lobar pneumonia, is always a serious complication.

Pulmonary edema is, in a majority of instances, a terminal symptom in fatal cases of various forms of acute and chronic disease.

Treatment.—In general the treatment is that indicated by the causative disease. The position of the patient should be frequently changed in order to prevent blood gravitating to the dependent portion of the lungs. If there is a large accumulation of fluid, relief may be obtained by letting the patient hang over the edge of the bed, with the head down. Dry cupping over the thorax, especially posteriorly and laterally is recommended. *Arsenicum* (3x) is the remedy above all others, especially if general dropsy be present. *Kali iod.* and *Pilocarpine* produce pulmonary edema, and will undoubtedly prove to be useful remedies, *Apis* (3x) may prove of value in cases caused by kidney disease, with scanty urine, absence of thirst, edema of the face and lids, etc. In edema of the lungs with dilated heart, characterized by great dyspnea and cyanosis, *Tartar emetic* (3x) is often an excellent remedy. If the heart's action is feeble and irregular, *Digitalis* (2x) may be required.

HEMOPTYSIS.

Synonyms.—Broncho-pulmonary Hemorrhage, Bronchorrhagia.

Definition.—An expectoration of blood, the source of the hemorrhage being from the mucous membrane of the lower respiratory tract, or from the lung substance. When from the bronchial mucosa, the term bronchorrhagia is applied. It is frequently impossible to demonstrate the source of the hemorrhage.

Pathology.—“The lesions are often microscopic, and consist for the most part of ruptured capillary blood vessels, though larger vessels may also become the seat of erosion or rupture. After death the bronchial mucosa is sometimes found to be swollen, bleeds easily, and is of a dark-red color—soon becoming decidedly pale. The lung tissue proper may look paler than in the sound lung. When hemoptysis occurs in advance of pulmonary tuberculosis, the lung cavity may contain a ruptured aneurysm, or mere ulceration of an exposed vessel may be observed. I have witnessed small, dark-red, dense masses in the air-sacs scattered throughout the lung, whence came the hemorrhage. Doubtless these are blood coagula, which result from the clotting of the blood after the latter has been carried into the alveoli. Various associated lesions may be observed.” (Anders.)

Etiology.—Slight hemorrhages may occur in young people who are in perfect health, and from no assignable cause. In some instances, however, the attack is brought on from great excitement, or muscular exertion, especially in high altitudes. As a rule, hemoptysis signifies

a pathological condition of some part of the system. Most often it results from some form of pulmonary disease, pulmonary tuberculosis being by far the most common cause, and which should always be suspected.

Hemorrhage may occur early in pulmonary disease from congestion occurring in the mucous lining of the small bronchi, but more often it originates from a minute tuberculous focus in the same tissue. Later on, hemorrhage results from the ulceration of an artery, or possibly an aneurysmal sac located in a branch of the pulmonary artery.

Hemorrhage may also occur during the initial stage of pneumonia, or from any other disease of the lungs, trachea, bronchi or larynx, involving congestion or ulceration, including pulmonary carcinoma and gangrene. Small repeated hemorrhages are common with the pulmonary congestion of heart disease, especially with lesions of the mitral valve. Aneurysm may give rise to small hemorrhages by pressure or by leakage through exposed laminæ of fibrin, and to large and fatal hemorrhages by rupture of the sac into the air passages. Hemorrhages may occur in the course of certain diseases, such as purpura hemorrhagica, scurvy, anemia, hemophilia, and malignant forms of certain acute infectious diseases, such as yellow fever, etc. Vicarious hemorrhages from the bronchi may occur with suppressed menstruation, and has been known to follow the removal of both ovaries. Hemoptysis may occur in elderly people, who have arthritic endarteritis. It occurs from injuries and contusions of the chest.

Symptoms.—The symptoms depend, somewhat, upon the source of the hemorrhage, but as a rule the difference is trifling and indefinite. Usually the hemorrhage occurs suddenly and without warning. In this way may the onset of pulmonary disease be announced. There may be a sense of heat and oppression of the chest, which those recognize who have experienced former attacks, or there may be general vascular fullness, headache, vertigo, palpitation of the heart, a quick, strong pulse, etc. The signs of pulmonary disease precede the hemorrhage, in a majority of cases, rather than succeed it. At the moment of the attack the patient experiences a sensation of warmth under the sternum, tickling in the throat, a sweetish taste in the mouth, which, upon attempting to remove by the act of coughing, a warm, saltish, bright red, frothy liquid comes from the mouth and sometimes from the nose. Even with a small hemorrhage the individual becomes depressed, pale and tremulous, often fainting, actual syncope occurring if the loss be great. If a fatal hemorrhage, the blood will pour out of the mouth and nose, there will be gurgling in the fauces, frantic efforts at respiration, a deadly pallor will overspread the face, and, with a general

convulsion in which the breathing ceases, all is over, but the heart will beat for a minute longer. The expectoration of blood does not always cease with the arrest of the hemorrhage, but returns for several days, in the meantime, expectoration being either bloody or streaked with blood. Auscultation usually reveals coarse, bubbling râles in circumscribed portions of the chest, but other physical signs are absent.

Diagnosis.—It is necessary to exclude hemorrhages from the upper air passages and stomach and those of a vicarious character, from epistaxis, or hemorrhage from the posterior nares, it is distinguished by the absence of air bubbles and an inspection of the fauces and the nasal cavities. The diagnosis between hemoptysis and hematemesis is often difficult. The chief points of differentiation are shown in the following table prepared by Anders:—

Hemoptysis.	Hematemesis.
History of cough and other symptoms points to pulmonary or cardiac disease.	The history points to gastric, splenic, hepatic, or cardiac disease.
A feeling of weight and uneasiness in the chest, a saline taste, and a tickling in the throat precede the hemorrhage.	A feeling of uneasiness, and sometimes of nausea or faintness, precedes the hemorrhage.
The blood is raised by coughing, though, if it be swallowed, vomiting may follow.	The blood is ejected by vomiting; violent vomiting may excite cough.
The blood is bright-red, frothy, in small coagula, and alkaline in reaction.	The blood is either clotted or fluid and dark, it may be mingled with remnants of food, and is acid in reaction.

Prognosis.—An attack of hemoptysis rarely results fatally, though it may so greatly reduce the patient as to materially hasten a fatal result. Profuse hemorrhage, from erosion of large branches of the pulmonary artery in lung cavities is often rapidly fatal. After light hemorrhages the patient often feels much relieved of his primary symptoms. Hemorrhage from thoracic aneurysm is fatal. In nine cases out of ten hemoptysis is a diagnostic sign of pulmonary tuberculosis. The fact that it often long precedes pulmonary symptoms is an argument in support of Niemeyer's view that phthisis is caused by hemoptysis.

Treatment.—Absolute rest in bed, the head and shoulders elevated, and perfect quiet, the diet to be bland, the drinks cool, the patient slowly swallowing small particles of ice. All hot drinks and stimulants should be prohibited; ice-bags to the chest are recommended, but should not be employed if they cause chilliness.

Hale says this "is a senseless procedure, because it contracts the capillaries of the chest wall, and increases the amount of blood in the lungs." Chapman advises a hot-water bag (120° F.) to the cervical and upper dorsal vertebræ. Common salt, slowly dissolved in the mouth, is a popular remedy, but seems of no real benefit. The hypodermic injection of *atropine sulphas*, gr. $\frac{1}{60}$, will usually at once control a hemorrhage. A spray of Monsel's salt, or of the chloride of iron is recommended. After the hemorrhage has ceased, if much blood has been lost, the patient should receive an injection of a normal salt solution.

During the intervals if a recurrence is anticipated, the recumbent position, quietude of mind, and the indicated remedies should be continued until all possibility of danger has passed.

Therapeutics.—**Aconite** (1x) is usually the first remedy to prescribe, especially when, with an active hemorrhage of bright red, frothy blood, there is great anxiety, restlessness, rapid pulse and constant cough.

Ipecac, (2x), is the remedy upon which I place most reliance; blood bright-red, frothy; worse from the least exertion; bubbling râles; oppressed breathing; faintness; nausea.

Millefolium (1x) has been used extensively. It resembles Aconite, only lacking the anxiety, and there is a less constant cough.

Hamamelis (Tincture).—This drug is used very extensively by homœopathic physicians, even though it is chiefly indicated in passive venous hemorrhages. Both professional and domestic experience proves that this valuable drug may be of service in any hemorrhage, whether arterial or venous. It is best used in the tincture or watery extract. Crawford says it "is very efficacious when there is difficulty in breathing, the patient being unable to lie down; there is a feeling of constriction across the chest, tickling cough, a taste of blood or of sulphur is experienced, and the blood is venous in hue."

Arnica (3x).—Hemorrhage from injuries or contusions on the chest, and from overexertion.

Erigeron.—I have great confidence in this remedy. The blood is bright red, and is increased by every movement. I use the tincture or oil in from three to five drops at a dose.

Sulphuric Acid.—Goodno recommends this drug for "cases of persistent hemoptysis, the blood being dark, and not marked by great quantity at any time, but by continual oozing. It agrees well with feeble, anemic women. It is best prescribed in ten to twenty drops of the acid in four ounces of water, teaspoonful doses every one to three hours."

Hydrastinine hydrochlorate is highly recommended for pulmonary as well as other hemorrhages. In urgent cases it may be given hypodermatically in doses of one quarter of a grain.

Phosphorus (3x).—This drug is rarely useful for the immediate attack, but is frequently indicated after, in phthisis and where lobar inflammation follows a hemorrhage as is sometimes the case.

Acalypha indica (Tincture) induces dry cough, followed by spitting of blood, which is its only characteristic, this having been repeatedly verified, by its prompt cure of hemoptysis. According to Hale, it is indicated when there is expectoration of pure blood in the morning, and dark lumps of clotted blood in the evening.

Digitalis (1x).—Hemoptysis from cardiac disease. Heart action feeble, great coolness of surface and prostration.

Geranium.—This remedy promises to be of great value in all forms of hemorrhage. Goodno advises it in cases where Aconite does not quickly relieve, in five-drop doses of the tincture.

Consult also *Acet. ac.* (1x), *Ars.* (3x), *Cactus* (3x), *Cinch.* (1x), *Ferr.* (6x), *Ledum* (2x), *Nitric ac.* (3x), *Sang.* (1x), *Sulph.* (30x), *Trillium* (1x).

PULMONARY APOPLEXY.

Synonym.—Pneumorrhagia.

Definition.—Hemorrhage into the substance of the lung, rarely diffuse, generally circumscribed with rupture of tissue infarct. (Hemorrhagic.)

Etiology and Pathology.—Diffuse pulmonary apoplexy results from the rupture of a thoracic aneurysm, or more often from severe contusions with penetrating wounds. Circumscribed hemorrhage into the lungs, or "hemorrhagic infarcts," is produced by the blocking of the branches of the pulmonary arteries by an embolus or thrombus, causing stasis, the circulation being entirely cut off from the parts so supplied, congestion occurring from backward pressure. In consequence, the vascular walls lose their consistency and allow the escape of blood into the surrounding tissues. A large branch of the pulmonary artery may become occluded without the formation of a hemorrhagic infarct. The latter usually ranges in size from that of a walnut to that of an orange, is wedge-shaped, and is usually situated near the base of the lung. In appearance it resembles a blood clot, being at first red and assuming a reddish-brown color. The pleura covering the infarct is usually inflamed, and often the contiguous lung tissue as well, sometimes giving the distinct signs of a circumscribed pleuro-pneumonia. Small infarcts may undergo absorption, but more often they form a pigmented,

shriveled cicatrix. In rare instances abscesses form, and sloughing and sometimes gangrene results.

Symptoms and Diagnosis.—The symptoms of diffuse pulmonary apoplexy are not characteristic. If profuse hemoptysis be accompanied by urgent dyspnea, cyanosis and signs of collapse, with sudden dullness on percussion and loud bronchial râles, diffuse pneumorrhagia should be suspected. Large hemorrhagic infarcts may present similar symptoms, rapidly ending in death. Small hemorrhagic infarcts may give rise to no symptoms whatever. Urgent dyspnea is the most important symptom. There is great oppression of the chest, usually pain in the side, considerable bloody expectoration, and sometimes unconsciousness and convulsions. Such symptoms occurring suddenly, especially in the course of chronic heart disease, particularly mitral stenosis, are very suggestive of circumscribed pulmonary apoplexy.

Prognosis.—The prognosis of the diffuse variety is practically hopeless. Hemorrhagic infarcts, if large, may prove suddenly fatal. Smaller ones present a grave prognosis, but absorption and recovery may take place. Infarcts may result in abscesses or gangrene, or may undergo fibroid change and contraction, and even calcify.

Treatment.—The treatment is purely symptomatic, the same remedies being indicated as for similar symptoms occurring in pneumonia and other pulmonary diseases.

LOBAR PNEUMONIA.

Synonyms.—Croupous Pneumonia, Fibrous Pneumonia, Pneumonitis, Pneumonic Fever, Lung Fever.

Definition.—An acute fibrinous or croupous inflammation of the lung parenchyma with marked constitutional disturbances. Now regarded as an infectious disease of microbic origin.

Pathology.—The lower right lobe is most frequently involved, the lower left lobe being the next most frequent seat of the disease.

Next comes the upper right lobe. Sometimes only a part of a lobe is involved. At other times a whole lobe, and occasionally the whole lung. In children and old people, the upper right lobe is frequently the one involved. The morbid process is usually divided into three stages: Congestion or engorgement; exudation or red hepatization; and resolution or gray hepatization. However, as gray hepatization does not always signify resolution, it is better to divide the process into four stages: (1) Congestion; (2) Red Hepatization; (3) Gray Hepatization; and (4) Resolution.

(1) **Congestion.**—The lung is heavy and much firmer than normal. The color is dark red or reddish-brown, not uniform, but mottled.

The cut surface is covered with bloody serum. Consistence is diminished, the tissue being easily torn. The microscope shows the blood vessels congested and the alveolar epithelium swollen. The air cells are partially filled with an exudate consisting of red blood corpuscles, epithelial cells and pus cells. This stage usually lasts only a few hours, but may be protracted for two or three days.

(2) *Red Hepatization*.—The lung is large, heavy, inelastic and very friable. Fragments immediately sink when placed in water. The cut surface is dry and of a dull reddish-brown color, becoming brighter on exposure, the appearance being less mottled than in the stage of congestion. Microscopic examination shows the air cells and very often the smaller bronchi filled with an exudate consisting of fibrin, red-blood cells, pus cells and epithelium. One fourth of our fatal cases occur during this stage, which may last as long as ten or twelve days.

(3) *Gray Hepatization*.—In this stage the lung remains heavy and solid, but the color changes gradually, in spots, to a brown or gray, thus giving a mottled appearance, which later becomes uniformly gray. The exudate begins to soften and degenerate, which takes place in all degrees from slight softening to what is termed "purulent infiltration." Three fourths of all fatal cases occur during this stage, one half during the mottled condition, which may last anywhere from two to eighteen days, and the other fourth after the gray stage is complete, which may be anywhere from the fourth to the twenty-fifth day.

(4) *Resolution*.—This occurs in spots in the same order as the gray hepatization took place. Fatty degeneration and liquefaction of the inflammatory products take place, followed by absorption and expectoration, the lung tissue remaining unaltered in structure. Resolution should begin soon after defervescence occurs, but it may be delayed for weeks.

In rare instances, the stage of gray hepatization is greatly prolonged, so that necrotic changes of portions of the lung substance takes place, and one or more abscesses are established. These may open into the bronchi leaving a cavity, or several joining cause a diffuse supuration. In some instances rupture into the pleura occurs, or, the abscesses may become encapsulated, and cheesy or calcareous changes take place. In some instances the exudate becomes organized connective tissue, entirely obliterating the air cells, and rendering that portion of the lung no longer of use. This condition is sometimes known as chronic induration. Gangrene of the lung is a rare termination. *Complicating lesions* are pleurisy, pericarditis, endocarditis, and meningitis. Pericarditis usually occurs only when the left lung is

involved and in children. Endocarditis most often occurs in those who have valvular disease. Meningitis is said to occur usually when there is also a malignant endocarditis, but I have seen many cases where such was not the case. Very often, in my own experience, especially in children, has it been impossible to decide whether the pneumonia or the meningitis was the primary disease.

Etiology.—According to present views, pneumonia is an infectious disease caused by the *micrococcus lancetolatus* of Fraenkel, more commonly known as the *diplococcus pneumoniae*. This bacillus is also found in the nasal and bronchial secretions of many persons who are in perfect health. If it is the specific cause of pneumonia, it therefore follows that there must be other causes operating that either develop the pathogenetic power of the bacillus, or which render the individual susceptible to its influence. These predisposing causes and conditions include those that were previously held to be primary exciting causes. Especially is this true as regards exposure to cold, or “catching cold,” which is now considered as only a means by which the individual is rendered more susceptible to infection. It occurs in all ages and in all temperate climates, being more frequent in this country during the months of February, March and April. Pneumonia is more frequent in men than in women. It is supposed to result from endemic and epidemic influences, unhygienic surroundings and alcoholism. Exposure to cold is the most frequent cause, especially in those worn out by worry and overwork, those compelled to endure hardships, and those suffering with chronic Bright's disease, diabetes, gout, rheumatism or other conditions inducing bodily weakness. One attack renders a person more susceptible to the disease, and repeated attacks are not uncommon. Traumatism is an important etiological factor as pneumonia frequently follows injuries, especially those of the chest.

Symptoms.—Prodromes occur in about one fourth of the cases, consisting usually of a bronchial catarrh, general indisposition with more or less aching pain, and lasts a day or two.

The onset of the disease is abrupt, being marked by a severe chill often lasting for an hour or more. In children there may be convulsions, and in adults vomiting is not uncommon. In old people the chill is usually less distinct. The chill is immediately followed by a rapid rise in temperature, reaching 103° to 105° F. within eight to twenty-four hours, and remaining high with slight nocturnal remissions until defervescence takes place. The pulse is strong, full and rapid, reaching 100 to 110 per minute in typical cases. Should the pulse rise higher than 110, there is reason to anticipate danger; and if it passes 120, there is real cause for alarm. “The rate may be increased either suddenly or

gradually, but in any event augmented frequency implies danger, since it is a certain indication of failure of heart power." The respiration becomes rapid and oppressed, varying from 40 to 60 per minute in adults, and from 60 to 90 or more in children. The respiration should not be above 40 in a typical case. Any number above that may be significant of pleuritic effusion or pulmonary edema. The inspirations are short and superficial and the expiration accompanied by a moan or grunt, due to oppression which in severe cases amounts to actual dyspnea. With the labored breathing comes the characteristic sharp, stabbing pain in the affected side near the nipple, aggravated by pressure, breathing or coughing, and which usually lasts two or three days, when it gradually disappears. The cough comes on early and is frequent, short and dry, being voluntarily repressed on account of the increased pain it induces. The cough is sometimes deferred until the stage of resolution, and sometimes is entirely absent, especially in old people. The sputum at first consists of a scanty, frothy mucus, soon becoming semitransparent, viscid and tenacious, about the second day changing to the familiar rusty sputum, becoming more copious and of a yellow color as the disease advances. The viscid, tenacious nature of the sputum, rendering expectoration difficult is characteristic. In severe cases pure blood may be expectorated, and in adynamic cases there may be the "prune juice" expectoration, consisting of an abundant dark brown fluid, which is always a grave symptom. From the very onset of the disease prostration is marked, and there may be anxiety, headache, restlessness, sleeplessness, occasionally delirium (especially in alcoholics), epistaxis, circumscribed mahogany flush on the cheek, dilatation of the *alæ nasi* during inspiration, herpes on the lips and nose, great thirst, gastric disturbances and scanty, high-colored urine, with diminished chlorides, and often albuminuria. The urine should be examined in every case to determine the presence of chronic Bright's disease, which would render the prognosis very grave.

The above-named symptoms continue more or less marked until defervescence takes place, which, in typical cases, occurs on the fifth or seventh day. It may in mild cases occur earlier, or on account of complications or sequelæ may be much longer delayed. Fatal cases of a typical type usually terminate on the seventh, eighth or tenth days. When defervescence occurs, the temperature usually falls rapidly and convalescence sets in within six or eight hours. In other cases the fall is more gradual, occupying from three to five days. Convalescence is usually rapid, and is sometimes accompanied by copious sweats or diarrhea. In some cases, especially in children, the tempera-

ture is remittent. In other cases the temperature may fall below normal about the fifth day, and rise again for two or three days, showing evening exacerbations. A high temperature persisting for ten days suggests purulent infiltration or empyema. A sudden rise in temperature at any time indicates a complication or an extension of the disease. In old people the temperature may be normal or even subnormal. Typhoid pneumonia is a term applied to those cases which are accompanied by signs of extreme prostration, delirium, tremor, very high temperature, dry tongue and profuse and prolonged exudation. They may also terminate by a crisis, but usually, if recovery takes place, convalescence is long and tedious.

In case purulent infiltration takes place during the stage of gray hepatization then defervescence does not take place, but the temperature rises, the pulse becomes more rapid and weak, there is a profuse purulent expectoration, profuse sweating, typhoid symptoms appear, and if recovery takes place, it is very slow and tedious.

Physical Signs.—Physical signs are rarely present on the first day, and, in central pneumonia, may not be evident until as late as the third day.

Stage of Congestion.—Consolidation has not yet taken place, though the lung tissue is more dense.

Inspection shows the movement of the affected side to be deficient. This is due partly to the pain, and partly to the fact that the degree of expansion is diminished. It is more noticeable when the base of the lung is involved. In double pneumonia there is costal breathing and labored action of the abdominal muscles.

Palpation.—The vocal fremitus is more distinct than normal over the affected area.

Percussion.—The sounds are usually not much altered, but may have a hollow or tympanitic quality.

Auscultation.—The respiratory sounds are weak, or may be somewhat bronchial. It has been usually considered that the crepitant râle during inspiration was the principal physical sign of the stage of congestion, but Anders holds that this characteristic râle "is rarely heard until the close of the first stage or until fibrin coats the pleural surfaces." He does not agree with the usual view that "this râle is produced in the air cells and finer bronchi." Subcrepitant râles due to an associated bronchitis may be audible.

Stage of Red Hepatization.—Consolidation has now taken place. *Inspection* shows great impairment of expansive movements of the affected side and an increase in these movements on the unaffected side. If both lungs are involved, there is superior costal breathing, respiration being carried on by the upper part of the chest.

Palpation.—Vocal fremitus is usually markedly increased, but in rare instances is decreased or entirely absent.

Percussion.—There is dullness with increased resistance. If consolidation is not complete, there may be a hollow or even tympanitic sound. The dullness is more absolute posteriorly, while anteriorly it may be more tympanitic. If only central portions of the lung are consolidated, the dullness is not so marked.

Auscultation.—The respiratory sounds are most frequently bronchial or tubular, though if the large bronchi are filled with exudate, these may be absent. Broncophony and in some cases pectoriloquy are present. Subcrepitant râles are often heard at the borders of the inflamed area, due to the associated bronchitis. According to Anders, the crepitant râle at the end of inspiration, which is supposed to be highly characteristic, “is best heard at the beginning of consolidation, when the pleura receives its coat of fibrin, and while the lung is yet capable of sufficient movement to produce pleural friction.” Frequently the heart sounds are intensified over the affected part.

Stage of Gray Hepatization.—*Inspection.*—Here we find the same physical signs as in the second stage, unless purulent infiltration and abscesses have formed. If resolution begins and the exudate in the air cells begins to liquefy and is partially removed, air re-enters the air cells and causes gradual increase in the expansile movements of the chest.

Palpation.—Vocal fremitus is gradually diminished.

Percussion.—Dullness and the increased resistance disappear, sometimes very rapidly, at other times very slowly. It is not uncommon for dullness to remain long after recovery, and, in some cases, it is permanent through life.

Auscultation.—There are usually crepitant râles, and both inspiration and expiration are associated with bubbling râles, either large or small, the coarser râles being heard over the bronchi. The breathing changes from bronchial to broncho-vesicular, gradually becoming normal.

Complications.—*Pleurisy* with effusion is the most frequent complication, and sometimes, in its intensity, overshadows the pneumonia. The more acute, localized pain, embarrassed and disproportionally rapid respiration, and the usual physical signs of effusion are the evidences of pleuro-pneumonia. Empyema may occur as a complication, but is more apt to occur as a sequel following defervescence. Its presence is marked by the occurrence of septic symptoms, erratic chills, irregular temperature, sweating and the usual physical signs. In doubtful cases the aspirator should be used.

Abscess is a serious complication. It is indicated by cavernous signs, the expectoration of purulent material, great prostration and symptoms of sepsis. In such cases the abscess is often a rapidly forming phthisical cavity. In doubtful cases the sputum should be examined for the tubercle bacillus.

Gangrene is a sequel of pneumonia rather than a complication. Its presence is rendered evident by the expectoration of a greenish or brownish fluid, of fetid, gangrenous odor, containing shreds of decomposed lung tissue and crystals of fatty acids.

Pericarditis.—This complication occurs more often in double pneumonia and in left-sided pneumonia, and especially in children. It is manifested by increased dyspnea, rapid and feeble pulse, venous congestions, and characteristic physical signs.

Endocarditis is a frequent complication, and is especially liable to attack persons with an old valvular disease. Neither the symptoms nor physical signs are reliable for diagnostic purposes. Malignant endocarditis should be suspected when septic and embolic symptoms are present.

Meningitis.—According to Osler, "by far the most important complication is the pneumonic *meningitis*, which varies much at different times and in different places. It usually comes on at the height of the fever, and in the majority of the cases is not recognized unless, as before mentioned, the base is involved, which is not common. Meningitis may develop later in the disease, and is then more easily diagnosed." This complication may be mistaken for epidemic cerebrospinal meningitis with complicating pneumonia, for tubercular meningitis with lesions in the lungs, and for uncomplicated pneumonia in children with marked cerebral symptoms. Gouty parotitis, jaundice and acute nephritis are occasional complications.

Pulmonary edema often ushers in a fatal termination. *Chronic interstitial pneumonia* or fibroid induration is a rare sequel.

Diagnosis.—Probably there is no acute disease in which the symptoms and physical signs are so characteristic, and the diagnosis correspondingly easy. The only probable difficulty is in differentiating between pneumonia and acute pneumonic phthisis. The following differential table is given by Anders:—

Primary Lobar Pneumonia.	Acute Pneumonic Phthisis.
There may have been prior attacks.	Inherited predisposition or previous tuberculous disease.
Sudden, with severe rigor and rapid rise of temperature.	Generally more gradual—repeated fits of chilliness (rarely severe rigor) often following exposure or "cold."

Fever of continued type, terminating by crisis.

No drenching sweats, except at time of crisis.

Herpes common.

Not much emaciation.

Pulse-respiration ratio considerably disturbed.

Sputum rusty-colored, viscid, and sticky; contains pneumococcus.

Duration of febrile stage shorter.

Physical signs, as a rule, first referable to base of lung.

Usually limited to one lobe or the lower portion of one lung.

Signs of consolidation, followed by resolution.

Apex of healthy side not involved.

Prognosis not hopeless.

Tuberculous disease of other organs does not follow as a rule.

Fever of remittent type, often becoming intermittent, without crisis.

Drenching sweats present and oft repeated.

Absent.

Rapid emaciation.

Less so.

Sputum may be blood-tinged; is more purulent and more copious, and contains numerous bacilli and yellow elastic tissue.

Duration longer.

First referable to apex.

Usually extension from apex to base.

Signs of consolidation, followed by cavity-formation, with large gurgling râles at apex.

Apex of opposite side generally invaded.

Hopeless.

Often does.

Prognosis.—The mortality of pneumonia is about fifteen per cent in private practice, according to old-school authorities, and twenty-five per cent in the hospitals. The statistics from homœopathic sources show a much lower rate. Typical cases occurring in healthy persons, excluding the aged and children, usually recover under proper treatment. The mortality in persons over sixty years of age is very great, the rate increasing progressively after the twentieth year to the seventieth. The prognosis also depends largely upon the extent of the inflammation and the presence or absence of complications. The pneumonia of drunkards is almost invariably fatal. Typhoid pneumonia, extensive bronchitis, acute meningitis, endocarditis, pulmonary edema, purulent infiltration, abscesses of the lungs and gangrene, all render the prognosis doubtful, and in many cases, exceedingly grave. Death usually results from cardiac failure.

Treatment.—The patient should be placed in a light, well-ventilated room, and the temperature kept at about 70° F. In the case of young children the temperature should be kept much higher — from 72° to 76° F., or even higher. The air should not be allowed to be too dry, but kept slightly moist by artificial means. The recumbent posture

should be steadfastly retained. The diet should be only liquids but nourishing. Milk, meat broths and meat juices, eggs shaken with milk and light farinaceous foods. The feeding should be systematic, nourishment being given at brief and regular intervals. Plenty of water may be allowed. Lemonade, grape-juice, tamarind water, etc., are grateful and harmless. Alcoholic stimulants should never be employed except in case of threatening exhaustion or heart failure and in the pneumonia of drunkards. Whisky or brandy, diluted, is the best form of liquor where any is indicated. The dose varies from one drachm to one ounce from one to three hours apart, according to the exigencies of the case. In cases of threatened heart failure, and alcoholic stimulants do not meet the requirements, Aromatic Spirits of Ammonia should be employed, or Strychnia may be used hypodermatically $\frac{1}{100}$ gr. every 3 or 4 hours, or Atropine $\frac{1}{100}$ gr. in the same manner. Glonoin $\frac{1}{100}$ gr. at a dose, either in a fresh reliable dilution (2x) or in granules, is often very effectual. My best results in such cases, especially where there has been extensive consolidation, has been with the use of pure oxygen gas, and, when obtainable, its use should never be neglected. It should be given freely, as frequent as the conditions make necessary. Much less reliance is placed on local applications than formerly. Doubtless hot fomentations and hot poultices are often useful when carefully handled, but in the latter there is always an element of danger, even when the attendant is an experienced nurse. Of late I have depended mostly upon a quilted cotton jacket. Sometimes lard or vaseline spread on a linen cloth and sprinkled with nutmeg or pepper is used. Such efforts have more effect upon the family and friends than they do upon the patient. Tepid sponge bathing is of great benefit, but all things considered, I do not believe that full baths, either cold or hot, as recommended by some authors, are beneficial, but are injurious. A rectal enema should be used sufficiently often to prevent overloading of the bowel, as the latter may seriously depress the heart's action.

Therapeutics.—Cases where either *Aconite* or *Verat. vir.* are not indicated in the immediate first stage, are of extremely rare occurrence. In cases where the initial symptoms are less violent than usual and in feeble, debilitated individuals, *Ferrum phos.* may be preferable. In most cases *Bryonia* is the remedy next indicated after *Aconite*, and very frequently after *Bryonia* come the indications for *Phosphorus*. Later on *Sang.* or *Sulph.* are often required. These remarks will apply to many cases, but are no justification, whatever, of a routine or pathological method of drug administration either in pneumonia or any other disease.

With due regard to clinical experience, and the well-known

effects of drugs in certain diseases and stages of disease, nevertheless, after all, their administration can only be safely and successfully applied according to the symptoms of the individual case.

Aconite (1x).—Aconite is indicated in the stage of congestion, when there is great arterial excitement, and before exudation occurs. It is also indicated during the initial chill, before the febrile stage has developed, often inducing a critical sweat and aborting the attack. It is never indicated unless there be present *great anxiety and restlessness*. If the patient be quiet and apathetic, Aconite is not the remedy (Verat. vir., Gels). It is especially indicated in cases where a hard chill is followed by a rapid rise in temperature, hard, full and frequent pulse, intense thirst and a dry, hot skin. The breathing is anxious and labored, there are stitches, or lancinating pain in the chest during cough or inspiration and a hard, dry, teasing and painful cough. Suddenness of onset, and especially when occurring in young plethoric patients, is characteristic of Aconite.

Veratrum vir. (1x).—This drug also is only indicated in the congestive stage. It is applicable to cases characterized by intense arterial excitement; rapidly rising and very high temperature; rapid, full, strong, *incompressible* pulse; extreme dyspnea; face livid. The symptoms of *Verat.* are more intense and violent than are those of Aconite, and like *Bell.* it is oftenest indicated in full-blooded plethoric persons. Instead of anxiety and restlessness as in Aconite, the patient is usually quiet and apathetic.

Ferrum phos. (3x).—Goodno says of this drug, it "is preferable for feeble individuals whose systems do not react so sharply against the poison, especially those who are suffering from debilitating chronic disease, or some acute affection, such as measles; or in feeble, anemic persons. The chill is not as pronounced, the temperature does not rise as rapidly, there is less of nervous excitement, than in the Aconite patient. There is quietness, often drowsiness, and the expectoration quickly becomes rusty, or contains much blood. This remedy is especially useful for secondary pneumonias associated with pulmonary phthisis, measles, or any of the infectious diseases. Marked pleurisy contraindicates it, while the existence of bronchial symptoms favors the selection of this medicine."

Bryonia (3x).—This remedy is indicated early in the disease, but not until after the extreme high fever, restlessness, etc., have been subdued by Aconite or Verat. vir., and exudation is about to occur, the symptoms being less violent. There is a dry, rough cough, but as yet little expectoration, that being mucous in character. There is considerable soreness, and the patient feels better when lying on the

affected side, and keeping perfectly quiet. The patient dreads to cough, and holds his breath to prevent it, on account of the pain it causes. Stitching pains are characteristic, and render Bryonia especially valuable in pleuro-pneumonia. There is usually considerable thirst and often gastric disturbances.

Phosphorus (3x).—Phosphorus is an invaluable remedy in pneumonia after exudation has taken place, and most commonly follows Bryonia. It is never indicated in the inflammatory stage of this or any other disease, but follows after the symptoms usually indicating Acon. and Bry. (not in alternation) have subsided, and the patient has a dry cough with bloody mucus, or rust-colored expectoration, violent oppression or tightness of the chest, difficult breathing, as if a heavy weight lay on the chest, worse when lying on the left side. The pains are not intense, but moderate and vaguely localized. May be useful when any part of the lungs is involved, but more often the lower lobe of the right lung. There is complete solidification of lung tissue, with dullness on percussion and an absence of vesicular murmur. In purulent infiltration and abscesses of lungs in the third stage of pneumonia, Phos. may be required. May be indicated in any stage of pneumonia when typhoid symptoms supervene. Chronic solidification of the lung after typhoid fever. Phosphorus follows Bryonia well, being complementary to it.

Sanguinaria (1x).—In many cases of pneumonia I find *Sang.* the remedy next indicated after Phos. It is only useful in the stage of gray hepatization, and particularly where resolution does not set in promptly, the patient giving evidences of a septic state. Hectic fever, with a circumscribed mahogany flush on the cheeks, indicates the drug. Abscesses following pneumonia, hypostatic pneumonia, typhoid pneumonia.

Sulphur (6x) is a remedy of great value when resolution does not take place, hepatization remaining, with dry cough, weakness, pressure or tightness in the chest. According to A. K. Crawford, "when high febrile symptoms persist after the completion of exudation, and the stage of resolution is delayed, without the development of typhoid symptoms; when the pneumonic processes seem to be at a standstill, and there appears to be danger of purulent infiltration setting in, instead of terminating by resolution, Sulphur is the remedy called for. The time for its employment is about the fifth or sixth day, when there is a great lack of reactionary force. It quickens into life the reabsorption process in such cases." It is often difficult to differentiate between Sulphur and Phosphorus. Gatchell gives the following differential points:—

Sulphur.

1. Amount of exudative material great.
2. Consolidation pronounced.
3. Catarrh not marked.
4. Vascular symptoms prominent.
5. Little or no expectoration.
6. Sthenic state; it is a condition of *suspense*; reaction does not promptly occur.

Phosphorus.

1. Amount of exudative material small.
2. Consolidation not extreme.
3. Much mucous secretion.
4. Nervous symptoms prominent.
5. Muco-purulent expectoration.
6. Adynamic state; typhoid-like symptoms, or, signs of suppuration.

Tartar emetic (3x).— This drug is more often indicated in catarrhal pneumonia, but it may be useful in the later stages of lobar pneumonia and pleuro-pneumonia when there is a great accumulation of mucus in the chest with loud râles, with great *oppression* and *dyspnea*, threatening suffocation, cyanotic symptoms. Relieved at once if expectoration or vomiting occurs. According to Gatchell the place for Tartar emetic is in "threatened pulmonary paresis, when the lungs are embarrassed by the abundance of its secretions, as indicated by extensive coarse râles and rattling of mucus, while, at the same time, owing to weakness, notwithstanding the loose cough, but little sputum is raised."

Chelidonium (1x).— According to Hughes this drug is "particularly valuable in pneumonia when the right lung is affected with involvement of the liver." Cough loose and rattling, expectoration difficult, oppressed breathing, hepatic disturbances, pain under right shoulder blade, etc.—"bilious pneumonia."

Rhus tox. (3x).— This is the chief remedy in typhoid pneumonia. There is autointoxication, from retrograde tissue metamorphosis, with active fever, loss of flesh and great prostration.

Veratrum album (2x) may be required when there is a state of collapse, with cold surface, and weak heart action, due to general exhaustion, especially when from diarrhea.

There are many other remedies that may be indicated in a typical case of pneumonia, according to the symptoms developed by the complications or sequelæ. Among those most often required are: *Ars.* (3x), *Ars. iod.* (2x), *Bell.* (3x), *Carbo veg.* (30x), *Digitalis* (1x), *Hepar sulph.* (3x), *Hyos.* (3x), *Iodine* (3x), *Kali carb.* (6x), *Lycop.* (6x), *Merc. sol.* (3x) and *Opium* (3x).

BRONCHO-PNEUMONIA.

Synonyms.— Catarrhal Pneumonia, Lobular Pneumonia, Capillary Bronchitis.

Definition.—Broncho-pneumonia “is essentially an inflammation of the terminal bronchus and the air vesicles which make up a pulmonary lobule, whence the term broncho-pneumonia. It is also known as lobular, in contradistinction to lobar pneumonia. The term catarrhal is less applicable. The process begins in all cases with an inflammation of the capillary bronchi, which is a condition rarely, if ever, found without involvement of the lobular structures, so that it is now customary to consider the affections together.” (Osler.)

Pathology.—The essential lesion is a bronchitis with inflammation of the immediately surrounding air spaces. According to Delafield, “The inflammation is from the first not exudative, but productive; that is, with the formation of new tissue.”

The inflammation of a lobule may involve adjacent lobules until an area of varying size, even to a whole lobe, may become consolidated. On section the inflamed patch appears smooth and lacks the granular appearance of the hepatization of lobar pneumonia. The smaller bronchi sometimes contain pus, and the walls of the smallest bronchi are found thickened by an infiltration of new cells, and are sometimes dilated. The lung tissue between the nodules may be either normal or congested and edematous, or it may be the seat of a diffuse pneumonia, in which the air spaces are partially filled with fibrin, pus, epithelial cells, and red blood cells, or the air spaces may be collapsed. These areas of collapse or atelectasis are depressed below the surrounding tissues and are of a bluish or blue-brown color. These areas may be small and may only surround the peribronchitic nodules, or the greater part of a lobe may be involved. Both lungs are usually involved. The bronchial glands are almost always swollen. The pulmonary pleuræ, covering the inflamed patches, are often covered with fibrin.

Etiology.—Broncho-pneumonia is most common in young children, but it may occur in adults and in old people. It prevails mostly in the winter and spring months. It results from exposure to wet and cold, from the inhalation of irritating vapors, and from unhygienic surroundings, especially impure air. In children it may occur primarily, or be associated with whooping cough, measles, scarlet fever and diphtheria. Broncho-pneumonia may also supervene upon certain acute infectious diseases, especially influenza, typhoid fever and small-pox, and in such, forms a grave complication.

Broncho-pneumonia may occur in any disease which keeps the patient in a recumbent posture, thus affording an easy entrance for irritating substances, bacterial or otherwise. Bronchial secretions retained in the tubes from debility or other causes, may gravitate downward and reach the terminal bronchi. “Deglutition pneumonia” is

that form of pneumonia produced by the passage of food or drink into the bronchi from choking at table, in deep coma, or from tracheotomy, intubation or cancer of the larynx or the esophagus. Suppuration or even gangrene may result in such cases. Broncho-pneumonia is said to be frequently caused by the tubercle bacillus. It may occur in a sub-acute form with advanced emphysema.

Symptoms.—In very young infants there may be no symptoms save fever, prostration, rapid breathing and very fine crepitant râles, even cough being frequently absent. Such cases usually prove fatal within a few days. In older babies and young children the symptoms are, in mild cases, largely those that have previously been described under capillary bronchitis. In such, a positive differential diagnosis from capillary bronchitis is extremely difficult and practically impossible. In severer cases the disease may be ushered in by convulsions or vomiting, though in those secondary to other diseases, the onset and symptoms are frequently so obscured by the symptoms of the primary disease, that the pneumonia may pass unsuspected throughout its entire course, or until well established. Symptoms of acute bronchitis are first present, the fever gradually increasing, but not running very high, and being irregular and remittent in its course. The temperature usually ranges from 101° to 104° F., but the severity of the case can not always be measured by the height of the fever, as cases with a temperature almost normal frequently prove serious, especially when occurring in infants or feeble children. The pulse is rapid, often as high as 160 to 180 per minute. In secondary cases the rapid breathing (60 to 80 per minute) is often the first symptom indicating the presence of broncho-pneumonia. And in primary cases it constitutes an important symptom. The *alæ nasi* dilate with each inspiratory effort, and expiration often is only a short moan or grunt, the dyspnea often being so great that nursing is impossible. Cyanosis is present to a greater or less extent, affecting first the lids and conjunctivæ, and later the face and finger tips. The cough comes on early and is usually hard, harassing, painful, and if the child be old enough, is accompanied by expectoration, otherwise it is swallowed, and sometimes vomited up later. The sputum is composed of mucus, occasionally streaked with blood, but never rust-colored.

A special form of broncho-pneumonia in children, known as cerebral, greatly simulates meningitis, the diagnosis from which is often quite difficult. In these cases restlessness, headache, convulsions, and delirium, with, in some instances, muscular twitchings and retraction of the head, become so marked that the pulmonary symptoms are overshadowed, and are not recognized until the cerebral symptoms subside, which is usually in from two to five days.

The *physical signs* in children consist chiefly in the presence of coarse and subcrepitant râles, which are very distinct, and on percussion varying areas of dullness, according to the extent of the disease. If the pneumonic patches are small and scattered, there may be no dullness, and, on the other hand, if large areas are involved, the dullness will be plainly marked, and there will also be a bronchial murmur or broncho-vesicular, and an increased vocal fremitus. Both lungs are involved, which is considered a diagnostic sign of broncho-pneumonia.

Duration.—Resolution is slower than in lobar pneumonia, and the attack does not terminate by crisis. In fatal cases death may occur in two or three days, but more often it is two or three weeks. Death may result from asphyxia or from exhaustion. Recovery generally takes place in from two to three weeks, though some cases run six or eight weeks. The disease may terminate in chronic interstitial pneumonia, in suppuration, in gangrene, or a tuberculosis may develop. Other cases simulate a tuberculous condition. The cough continues, there is progressive emaciation, and hectic develops with night sweats. The physical signs of a general bronchitis are present, and circumscribed areas of consolidated lung tissues, but there are no bacilli in the sputum. The case may drag along for two or three months, and the patient finally recover, or later the child dies from exhaustion, autopsy showing extensive interstitial pneumonia with large bronchiectatic cavities.

Diagnosis.—It is often difficult to distinguish between broncho-pneumonia and bronchitis, capillary bronchitis, lobar pneumonia and phthisis. The history of the case, the nature of the primary disease, the presence of consolidated areas in both lungs, the predominance of bronchitis symptoms over those of pneumonia, the dyspnea and cyanosis, the irregular and comparatively moderate type of fever, are usually sufficient for diagnostic purposes. The mistake most often made is in differentiating from lobar pneumonia. Anders gives the following points of distinction :—

Broncho-Pneumonia.

Usually secondary to bronchitis and acute infectious diseases (e. g., measles, whooping cough).

Onset gradual.

Fever is, in proportion to the extent of inflammation, of irregular type, and declines by lysis after a variable duration.

Sputum glairy, tenacious, and in adults, may be blood-tinged.

Lobar Pneumonia.

Usually a primary disease.

Onset abrupt; previous health generally good.

Fever is high, of continued type, and falls between the fifth and ninth days by crisis.

Sputum characteristic (rusty or prune-juice).

Dyspnea and evidence of carbon-dioxide poisoning prominent.

Physical signs of general bronchitis always marked, and usually preponderating over those of consolidation.

Consolidation commonly bilateral.

Duration indefinite, often extending over many weeks.

Consolidated areas liable to become the seat of tuberculous infection.

Respiration panting, but dyspnea and cyanosis relatively less marked.

Signs of bronchitis generally absent, those of lobar consolidation always preponderating.

Commonly unilateral.

Duration definite as a rule, convalescence following crisis.

Far less likely to become the seat of tuberculous infection.

Prognosis.—The prognosis depends entirely upon the extent of the lobular inflammation, the character of the associated disease and the physical condition of the patient at the time of invasion. Cases occurring in feeble children, and those with unhygienic surroundings, or when secondary to some serious infectious or organic disease, the prognosis is very grave. The disease is less dangerous when complicating measles than when it develops in the course of whooping cough, influenza or diphtheria. Deglutition pneumonia is always a grave disease. Severe cases sometimes recover when least expected.

Broncho-pneumonia in Adults.—Delafield thus describes the principal features of several clinical varieties of the disease as it occurs in adults:—

“1. There is first ordinary bronchitis for several days, but, instead of recovering, the patient continues to cough and to feel sick, and at some part of the chest there is found a small area of dullness and high-pitched voice. The consolidation lasts but a short time, and the patient regularly recovers.

“2. The patient is seized by a chill; there are rapid and high fever, pains in the back and the chest, great prostration, rapid and feeble pulse, rapid and insufficient breathing, cough with mucus and blood-stained sputa, sleeplessness, restlessness and delirium. The urine contains albumen and casts; the skin is cyanosed; the viscera are congested. Over both chests the percussion-note is normal, exaggerated, or dull. Coarse subcrepitant and crepitant râles with sibilant and sonorous breathing are heard. The disease lasts for one or two weeks, and is apt to prove fatal.

“3. A form of broncho-pneumonia resembles lobar pneumonia. There is a general bronchitis, with broncho-pneumonia and consolidation of one or more lobes. Compared with lobar pneumonia, the invasion is more gradual, the pulse is more rapid, cerebral symptoms are more constant, the sputum is that of bronchitis, the physical signs are delayed in their appearance, the duration is longer, and resolution is slower.

"4. A form resembles tubercular broncho-pneumonia. The invasion is gradual, and the disease is protracted for weeks. The patients have fever with evening exacerbations and night sweats, cough with muco-purulent expectoration which does not contain tubercle bacilli, and there is a loss of flesh and of strength. Physical signs show bronchitis with localized areas of consolidation. Some patients recover after a number of weeks; in others the disease proves fatal.

"5. Patients with emphysema may develop a subacute broncho-pneumonia which is often fatal.

"6. Broncho-pneumonia, especially of the lower lobes, may be seen in infectious diseases, injuries, and operations which cause congestion of the lungs and allow of the inhalation of streptococci."

Treatment.—Much can be done to prevent an attack of broncho-pneumonia. Chief of all is protection from taking cold when recovering from measles and whooping cough, etc., and in the course of an acute bronchitis. All catarrhal conditions should receive careful attention, especially in the very young, the aged, or those in feeble health. The patient should occupy a well-ventilated apartment, with a uniform temperature of from 70° to 72° F. Quiet should be insured, and the position in bed changed frequently to prevent hypostatic congestion. As there is usually great prostration, and especially in the feeble, the diet should be supportive, consisting of nourishing liquid foods. Different from lobar pneumonia these cases, as a rule, do better, in the active stage, with a jacket-poultice of linseed meal covered with oil silk, and kept continually hot. Later a cotton jacket should be substituted. Threatened asphyxia and heart failure demand stimulants or the inhalation of oxygen gas. In some cases digitalis and strychnia may be required.

Therapeutics. — *Aconite* (2x) may be the first remedy required if its indications are present, but more often *Ferrum phos.* (3x) will answer a better purpose. Of the latter remedy Goodno says: "The results that have followed its exhibition are both numerous and brilliant. Its administration is only contraindicated by marked bronchial obstruction, manifested by dyspnea, moderate fever, impaired surface circulation, heart feebleness, and cyanosis." The next remedy usually required is *Tartar emet.* (3x) for the rattling breathing, drowsiness, cyanosis, etc., of that drug. The more prominent the symptoms of capillary involvement, the more often *Tartar emet.* is required. *Ipecac* (3x), *Sambucus* (1x) and *Squilla* (1x) are remedies often indicated. *Phosphorus* (3x), *Hepar. sulph.* (3x), *Bryonia* (3x) and *Sulphur* (6x) are frequently required. The indications for these and other useful remedies are the same as have already been given under Acute Catarrhal Bronchitis and Lobar Pneumonia, and need not be repeated.

CHRONIC INTERSTITIAL PNEUMONIA.

Synonyms.—Fibroid Induration, Cirrhosis of the Lung.

Definition.—A chronic inflammation of the lung parenchyma resulting in the formation of fibrous connective tissue and the obliteration of the air spaces. It may be primary or secondary and either local or diffuse.

Pathology.—The lesions in the local and diffuse forms are the same, and consist in the growth of connective tissue which replaces the normal lung structure, the air spaces being diminished in size or entirely obliterated. The bronchi are often greatly dilated, forming bronchiectatic cavities. Lung cavities are present, and may be either tuberculous, or in rare cases, non-tuberculous. Similar connective tissue changes may be found in the pleura, which becomes more or less firm and thick and adherent. Usually one lung is affected, which becomes much shrunk, and lies tightly against the spine. The heart is enlarged, and lies on the affected side. There may be either a compensatory hypertrophy of the right ventricle or its dilatation with general venous congestions. The pulmonary artery is the seat of atheromatous change. The unaffected lung is apt to be emphysematous.

Etiology.—Chronic interstitial pneumonia may occur primarily from the inhalation of various dust-like particles. When this is the case, the term "pneumonokoniosis" has been applied, with special names, according to the nature of the inhaled particles. The chief among these are: Anthracosis (coal-miner's disease), due to the inhalation of coal dust; Chalicosis (stone-cutter's phthisis), caused by the inhalation of mineral dusts; and Siderosis, caused by inhaling metallic particles, particularly iron oxide. Aside from pneumonokoniosis chronic interstitial pneumonia is always a secondary disease, and may follow acute lobar pneumonia, broncho-pneumonia, atelectasis, pleuritic adhesions and chronic bronchitis. It may also be associated with pulmonary tuberculosis, emphysema, syphilitic pneumonia and hydatids. The diffuse form is said to more often follow acute or chronic broncho-pneumonia.

Symptoms.—The onset of the disease is gradual. There is a cough which gradually increases with the progress of the disease. The expectoration is mucous or muco-purulent. In rare cases there may be repeated slight hemorrhages. In some instances bronchiectatic cavities are present, giving their usual characteristic symptoms. Dyspnea is present, its severity depending upon the extent of the disease and the presence of a dilated right heart. In the latter case,

especially, the dyspnea is always worse on ascending a height. In pneumonokoniosis there is great dyspnea due to emphysema. Fever is not present except in case of suppurating bronchiectatic cavities, when the hectic symptoms produced simulate those of pulmonary tuberculosis. There is loss of flesh and strength.

Inspection.—The whole affected side is retracted, often to an extreme degree, the movements are deficient or entirely absent, and the intercostal spaces are obliterated.

Percussion.—The percussion note is usually hard and high-pitched, but varies with the condition of the bronchi.

Auscultation.—The respiratory sounds are usually weak or absent at the base and cavernous at the apex. Bronchial or tubular sounds are also heard. Bubbling mucous râles are usually heard at the base. The vocal sounds vary, but are usually aggravated. The heart is often found displaced toward the affected side and cardiac murmurs may be heard late in the disease when the right heart is failing.

Diagnosis.—With the physical signs above noted there can be little difficulty in diagnosis. Sometimes it is impossible to distinguish this disease from fibroid phthisis, but the history, the physical signs, the probable involvement of both lungs, and the presence of the tubercle bacillus is generally sufficient. In pneumonokoniosis the sputum is diagnostic. In anthracosis it is very dark; in chalicosis the microscope shows particles of silica; in siderosis the expectoration is of a red-dish color.

Prognosis.—The disease may last for many years, death finally resulting direct in rare cases, but more often to gradual failure of the right heart, with dropsy. (Osler.) Fatal results usually follow an intercurrent acute pneumonia of the other lung. Tubercular disease is very liable to occur at any time. The prognosis in pneumonokoniosis is favorable in the earlier stages if the patient be removed from the occupation and conditions causing the disease. In the advanced stage there can be nothing done.

Treatment.—These cases are supposed to be ultimately fatal, but much can be done with remedies to mitigate the disease and lengthen life. A change of residence to a mild climate is very desirable. The *therapeutics* will depend largely upon the bronchial or cardiac symptoms that may supervene. For the connective tissue changes *Silicea* is by far the most important remedy. It should be given in the 6x trit. or in a higher dilution, and persistently administered prescribing other remedies for intercurrent symptoms and conditions as they arise. *Sulphur* (6x) is the remedy next in importance. Consult also *Ars. iod.* (3x), *Calc. iod.* (2x) and *Calc. phos.* (3x.)

EMPHYSEMA.

Definition.—Emphysema signifies an infiltration of the connective tissue with air, and when applied to the lungs involves also a dilatation of the alveoli. There are two general varieties: (1) Interlobular, and (2) Vesicular.

1. Interlobular Emphysema.

Synonym.—Subpleural Emphysema.

Definition.—The presence of air in the interlobular connective tissue beneath the pleura.

Pathology.—There is rupture of the air cells, the air escaping into the interlobular connective tissue, sometimes to such an extent as to perforate the pleura and cause pneumothorax. In very rare cases, there is a rupture at the root of the lung; the air, finding its way into the mediastinum and following along the trachea, passes into the subcutaneous tissues of the neck.

Etiology.—Interlobular emphysema is usually caused by violent expiratory efforts, as in severe paroxysms of coughing, especially in whooping cough. Less often it results from straining at stool, or during parturition,—or other violent muscular exertion and during convulsions. It may occur from external injuries to the lung, especially from a fractured rib, or a perforating wound.

According to Osler it is not a very serious condition, and rarely produces symptoms.

2. Vesicular Emphysema.

Synonym.—Alveolar Ectasis.

Definition.—Dilatation of, or increase in, the size and capacity of the infundibular passages and alveoli.

Varieties.—Three forms are recognized: (1) Compensating; (2) Hypertrophic; (3) Atrophic.

1. *Compensating Emphysema.*—When part of the lung is so disabled that it can not expand fully, the remaining portions have to expand, or the chest wall will fall in. Compensatory emphysema consists, then, simply in an overstretched condition of the lung, with distended air vesicles whose walls are thinned. It occurs in connection with circumscribed morbid processes such as occur in pulmonary tuberculosis, lobular pneumonia, cirrhosis, and pleurisy with adhesions. When the whole or a greater part of one lung is involved in the primary disease, the opposite lung may become emphysematous, but when only a portion of the lung is diseased the remainder of the same

lung may become distended. The condition is a normal compensating process, is beneficial, gives rise to no symptoms or reliable physical signs, and disappears with the subsidence of the causative disease.

2. *Hypertrophic Emphysema*.— This form, also known as substantive or idiopathic emphysema, is a well-marked clinical affection, characterized by enlargement of the lungs, due to distention of the air cells and atrophy of their walls, and clinically by imperfect aeration of the blood and more or less marked dyspnea. (Osler).

Pathology.—The thorax is enlarged (barrel-shaped), and upon removing the sternum the lungs are found to completely fill the mediastinum, and do not retract as in health. They present a pale, anemic appearance, and may show dark pigmented patches and streaks, while to the feel they appear soft and feathery, though dry. They readily pit on pressure, the latter being characteristic. The vesicular walls are thinner and slighter, the vesicles are greatly enlarged, sometimes to the size of a pea or bean, and have an irregular shape, and traversing most of these large cysts (dilated vesicles) a few delicate bands, the remains of the lacerated interalveolar septa, are visible. With the destruction of the septa many of the capillaries are destroyed, whereby the emphysematous tissue is remarkably bloodless and dry.

In consequence of the destruction of so many of the capillaries, the obstruction to the pulmonary circulation becomes so great that the pulmonary artery and right cavities of the heart undergo granular, followed by fatty, degeneration. The distention of the veins results in a general venous stasis, to wit: nutmeg liver, congested kidneys and gastrointestinal catarrh.

Etiology.—The exciting cause is the result either of a too forcible and long-continued inspiration—the theory of inspiration—or the excessive mechanical distention of the vesicular walls by forced expiration—the theory of expiration. But for either of these theories to be operative, the lung structure must be congenitally weak, for if violent respiratory efforts alone were the essential factor, the disease would be much more frequent.

Osler says: “Emphysema is the result of persistently high intra-alveolar tension acting upon a congenitally weak lung tissue.”

Delafield describes the disease as a chronic interstitial inflammation of the lung, with which condition more or less dilatation of the air spaces is usually, but not invariably, associated. Whatever may be the actual cause of emphysema, it is certain that it is secondary to, and results from, other lung diseases, especially chronic bronchitis, whooping cough and bronchial asthma. It may also be caused by certain occupations requiring great muscular exertion, or blowing wind instruments.

Oftener such causes are predisposing rather than exciting. Congestion of the lungs associated with mitral valvular disease also predisposes to emphysema. What is known as vicarious emphysema is a distention of the air cells of the healthy portion of the lung, some other part being the seat of consolidation.

Symptoms.—Dyspnea is the most prominent symptom. It is at first slight and only noticed on exertion, as on going upstairs, running or walking rapidly, or during an attack of indigestion or bronchitis. Later it becomes more persistent, and the respirations usually being harsh and wheezy, the inspiration short and the expiration distinctly prolonged. There is more or less cough, the result of an attending bronchitis. It is paroxysmal in character, and there is a muco-purulent expectoration. There are intercurrent attacks of bronchitis during which the cough and expectoration are increased, and there may be slight fever and night sweats, and occasionally bloody expectoration. Cyanosis of an extreme grade occurs in the later stages, due to obstruction in the cardio-pulmonary circulation. Even when markedly cyanotic, the patient appears not to suffer from it. The discomfort of the patient is often increased by paroxysms of asthma. When compensation fails and the right heart dilates, general venous congestions are gradually developed—congestion and edema of the skin, congestion of the stomach, the liver and the kidneys, and general dropsy.

The following variations in clinical types of the disease are described by Delafield:—

“ 1. Some patients for years have a winter cough, with expectoration of mucus and sometimes of a little blood. They are always a little short of breath when they exert themselves. After a time they have attacks of spasmodic asthma. Then the dyspnea on exertion becomes more constant and more decided; the patients lose flesh and strength; venous congestion is established, dropsy and death.

“ 2. Other patients are fairly well, except when they have attacks of acute bronchitis. Such attacks may be mild, lasting a few days or a few weeks; with cough, mucous expectoration, sometimes hemoptysis, asthmatic breathing, and a febrile movement; or the attacks may be severe, and last two or three months, and, in addition to the symptoms just mentioned, they develop venous congestion, albuminuria and dropsy.

“ 3. In some patients there is a history of attacks of spasmodic asthma for a number of years before the symptoms of emphysema make their appearance.

“ 4. In some patients the evidences of emphysema are very slight for a long time. Then rather suddenly constant dyspnea and venous congestion are developed, and the patients die in a few months.”

Physical Signs.— In some advanced cases the anterior posterior diameter of the chest is increased, giving what is termed the “barrel-shaped” chest, the thorax having an abnormally rounded appearance. The respiratory acts are labored, the diaphragm and abdominal muscles showing great exertion. The lungs are constantly in a state approaching full expansion, and the thorax in emphysema has been aptly described as being in a state of “permanent inspiration.”

Palpation shows a diminished vocal fremitus, and the cardiac impulse depressed and feeble and nearer the sternum.

Percussion yields a hyperresonance of a tympanitic quality or the resonance may be of a variety of tympany of a dull quality. This latter note, often called “wooden,” is highly characteristic. The percussion boundaries of the lung are increased in all dimensions. The hepatic dullness may not begin until the inferior margin of the ribs is reached; the cardiac dullness is lessened on account of the emphysematous lung nearly covering the heart. Auscultation reveals a weakened vesicular murmur, and in pronounced cases it is almost absent. The inspiration is short and feeble and the expiration always prolonged and of a lower pitch. There are sibilant and bubbling râles. The first sound of the heart is lessened in intensity and duration, the second sound being sharply accentuated.

Diagnosis.— In the early stages, especially in children, a diagnosis is impossible. Later on the symptoms and physical signs are characteristic and diagnostic. Pneumothorax is the disease most apt to be confounded with emphysema. Its development is sudden, and its symptoms more constantly and urgently distressing.

Prognosis.— Hypertrophic emphysema is essentially a chronic disease, and, while life may not be materially shortened, the prognosis as to recovery entirely is unfavorable. If aggravated from any cause or associated with frequent attacks of bronchitis or asthma, a lack of compensation is hastened and cardiac changes occur, general dropsy supervenes, and death results from exhaustion, or often from an intercurrent attack of pneumonia. Life is often prolonged and sufferings mitigated by proper care and treatment. Acute cases occurring in the course of whooping cough, etc., are often cured.

Treatment.— Diet and hygiene are of great importance. The former should be nourishing but easily digested, and late in the disease it may be necessary to restrict the food to milk or prepared peptonized foods. Starches and sugars should be avoided, and the use of tobacco or alcoholic liquors prohibited. The patient should, if possible, spend the winter months, at least, in a warm, equable climate, in order to avoid attacks of bronchitis, the latter, when occurring, should receive

prompt attention. Moderate exercise in the open air is desirable, but it should not be carried to the point of fatigue. Inhalations of oxygen are highly recommended. Anders says: "The *pneumatic treatment*, comprising the inhalation of compressed air and the breathing into rarefied air, richly deserves further trial, its use having been productive of permanent improvement in a number of cases, as shown by physical examination (including mensuration)." The remedies required are chiefly those indicated by the intercurrent conditions, especially bronchitis, asthma and cardiac disease, and the reader is referred to the therapeutics of those diseases elsewhere considered. So far as known there are no medicines for emphysema *per se*. The treatment must be purely symptomatic.

3. *Atrophic Emphysema*.—This is a primary atrophy of the lung, coming on in advanced life from senile changes. The lungs contain less than the normal volume of air, instead of an abnormal quantity as in true hypertrophic emphysema, and as a result occupy less space in the chest cavity than do healthy lungs. The symptoms are negative, and the condition one that does not admit of successful treatment.

GANGRENE OF THE LUNGS.

Pathology.—There are two forms of gangrene of the lungs recognized: diffuse and circumscribed.

The diffuse variety is very rare. It may be diffuse from the start, or may follow the circumscribed form. It occasionally follows lobar pneumonia, and in very exceptional cases results in occlusion of a large branch of the pulmonary artery. A lobe, or the greater part of a lobe, or even the entire lung, may thus become gangrenous, with no well-marked line of demarcation.

The circumscribed variety presents a plain line of demarcation "between the gangrenous area and the surrounding tissue. The focus may be single, or there may be two or more. The lower lobe is more commonly affected than the upper, and the peripheral more than the central portion of the lung. A gangrenous area is at first uniformly greenish-brown in color; but softening rapidly takes place with the formation of a cavity with shreddy, irregular walls, and a greenish, offensive fluid. The lung tissue in the immediate neighborhood shows a zone of deep congestion, often consolidation, and outside this an intense edema. In the embolic cases the plugged artery can sometimes be found. When rapidly extending, vessels may be opened and violent hemorrhage ensue. Perforation of the pleura is not uncommon. The

irritating decomposing material usually excites the most intense bronchitis. Embolic processes are not infrequent. There is a remarkable association in some cases between circumscribed gangrene of the lung and abscess of the brain." (Osler.)

Etiology.—According to bacteriologists, gangrene of the lungs is caused by the inhalation of the putrefactive bacteria. The disease is exceedingly rare, though putrefactive bacteria are abundant, and are inhaled more or less constantly by everybody. It is therefore claimed that the specific bacteria are not capable of producing the disease unless the lung tissue be "impaired or peculiarly altered," and that this diseased receptivity to bacterial infection is brought about by certain causes and conditions, which have heretofore been recognized as the direct causes of the disease. Therefore, from a practical standpoint, the bacterial origin of gangrene (or any other disease) does not figure much, as it is the original and long-recognized causes after all that must be considered; and whether they are termed exciting or predisposing does not matter. Gangrene of the lungs is most often caused by the entrance of foreign bodies into the trachea, from food or other particles being inhaled, from "deglutition pneumonia," or from perforation of the bronchi or lung by cancer of the esophagus. It may follow cavities in the lung, bronchiectasis, fetid bronchitis, wounds of the lung, and, rarely, lobar pneumonia. It is occasionally due to compression or embolism of the bronchus, of the pulmonary or bronchial arteries or pressure from a thoracic aneurysm. It occurs with comparative frequency in diabetes, and less often in debilitated states from protracted fevers or other causes.

Symptoms.—At first there may only be prostration and a high, irregular temperature, after communication with the bronchi is established, the cough already present, causes an expectoration of the materials of the gangrenous decomposition. The sputum is a sanguinolent, sanious, or sero-mucous fluid, of brownish dark-green, or even blackish tint, having a horribly fetid odor, compounded of decomposing animal matter and feces, and so sickening that the patient himself, as well as those about him, is nauseated by it. That the odor is due to foul gases, is evident from the fact that the breath on forced expiration is full of the odor, and the sputa allowed to stand, cease after a time to have the smell. The odor may precede the expectoration, and may disappear for a time, to reappear again. The sputa, on standing separate into three distinct layers: the uppermost, frothy, of a dark, greenish-yellow color, is composed of muco-pus chiefly; the middle layer is sero-albuminous and translucent, the lowest layer

contains a sediment, greenish or brownish in color, with yellow or brownish flakes and masses of decomposing lung tissue. Again, the sputa may be made up largely of black blood, in a decomposing state. (Hertz.) Blood is often present in the sputa, and large hemorrhages may occur. The elevation of temperature may be very considerable, but the thermal line is that of septicemia; irregular chills, high fever and profuse sweats. The complexion is fawn color, livid, the expression anxious, the face sunken, the skin relaxed, the pulse quick and feeble, and the respirations are hurried and catching. There is usually severe pain in the side, and the decubitus is toward and on the affected side. There is an incessant and very painful suppressed cough. The vital powers become rapidly exhausted, the patient loses flesh and strength, and lapses into a typhoid condition.

The *physical signs* are those due to consolidation, with dullness on percussion, abundant coarse mucous râles, bronchial breathing and bronchial voice. After the softening and extrusion of the gangrenous portions, the physical signs will correspond, and the symptoms of a cavity will be present.

Diagnosis.—Fetor of the breath and of the sputa would be sufficient for diagnostic purposes were it not that a fetid odor, not easily distinguished, is present in fetid bronchitis and bronchiectasis. In the latter conditions, however, the odor is much more feeble, and has not the penetrating peculiarity of the gangrenous odor, and the symptoms are less active and severe, and there is an entirely different history. In gangrene there are present the physical signs of pulmonary disease, which are absent in bronchitis.

Prognosis.—The prognosis is exceedingly grave. The usual termination is in death, after two or three or even six weeks of the circumscribed form, and in a week or two of the diffused form. Occasionally cases recover in the circumscribed form. Other cases partially recover, but every now and then fresh inflammation arises, more tissue is destroyed, until death finally ensues. Exhaustion and hemorrhage are the chief dangers.

Treatment.—The strength should be supported by nourishing diet, consisting of milk or concentrated liquids, given regularly and at frequent intervals. Alcoholic stimulants are of more than usual service. Antiseptic inhalants and sprays should be used. I prefer *eucalyptus*, carbolic acid, iodine or creosote, used in a hot-air inspirator, rather than sprays. Not only can the medicament be inhaled to reach the diseased area, but the hot air is in itself a germicide. The patient should wear continuously a Robinson inhaler saturated with equal parts of alcohol, creosote and chloroform. If the gangrenous area be local-

ized near the surface of the lung, injections of antiseptics may be made directly into it, and if the patient be in fair condition, the cavity may be opened through the chest wall and drained. But little benefit seems to be obtained from internal medication. The remedies to be consulted are: *Arsen.* (3x), *Carb. acid* (2x), *Carbo veg.* (6x), *Creosote* (2x), *Eucalyp.* (1x), *Iodine* (2x), *Lachesis* (6.) and *Secale* (2x).

ABSCESS OF THE LUNGS.

Pathology.—There may be an ordinary abscess varying in size from a walnut to an orange; with ragged and irregular walls, the contents being purulent and sometimes necrotic. In rare cases there may be only an infiltration of the blood vessels, bronchi or interstitial tissue.

Etiology.—Abscess of the lungs may result from lobar pneumonia, in which the infiltration form is most frequent. It may also follow aspiration or deglutition pneumonia, traumatism, suppurating bronchial glands, suppurating hydatid cysts, abscess of the liver, purulent pleurisy, and is frequently associated with pulmonary tuberculosis. One of the most frequent causes of abscess of the lung is emboli, which give rise to metastatic abscesses. Multiple abscesses frequently occur with pyemia or with malignant endocarditis involving the right heart. At first the lesion resembles an ordinary hemorrhagic infarction, but the embolic area rapidly becomes purulent and softens to form a cavity, while the pleura over it becomes infected, resulting usually in empyema or pyo-pneumothorax.

Symptoms and Diagnosis.—The symptoms vary according to the nature of the primary disease. In abscess following pneumonia the respirations, however, are quickened, the temperature becomes higher, and the patient is evidently much worse. The sputum is yellow or greenish-yellow, contains shreds of lung tissue, and emits a fetor less pronounced than that of gangrene or fetid bronchitis. Pain is present if the pleuræ are involved. If the abscess is large, the signs of a cavity are present, but not otherwise. The general symptoms are those of sepsis. Embolic abscesses are not usually recognized.

Prognosis.—Embolic cases almost invariably run a fatal course, as do those resulting from the perforation of the lung by a hepatic abscess or empyema. Cases following pneumonia often recover under proper treatment. Much depends upon the constitutional condition of the patient.

Treatment.—The diet and general treatment are the same as recommended for gangrene of the lungs. Surgical treatment consists in the opening and drainage of the abscess cavity. Improvement or recovery is claimed in about one half the cases surgically treated.

The medicine required will depend largely upon the symptoms of the individual case. For the suppurative process alone, *Silicea* (6x) is the chief remedy, and its virtues can hardly be overestimated. If *Hepar sulph.* is prescribed, it should be given in the thirtieth or a higher potency. In a low potency, it encourages rather than checks the suppurative process. Also consult *Arsen.* (3x), *Arsen. iod.* (3x), *Calc. carb.* (6x), *Calc. iod.* (2x), *Cinch.* (2x), *Iodine* (2x), *Lach.* (6.), *Merc. sol.* (3x) and *Sulph.* (30x).

TUBERCULOSIS.

Definition.—An infectious disease, either acute or chronic, caused by the bacillus tuberculosis, and characterized by the production of a new tissue of low vitality.

Geographical Distribution.—While tuberculosis may and does prevail in all portions of the world, yet it is more prevalent in some localities than in others; local conditions, as well as atmospheric, playing an important rôle as predisposing causes. As a rule, tuberculosis is more prevalent in a cold climate than in a warm climate, yet we find that the frequency of the disease lessens as we approach the northern or southern Polar regions. This is partly due to the dryness of the atmosphere in these regions. Localities presenting both cold and moisture show the largest percentage of cases. For the same reason, mountainous countries are remarkably free from the disease, the purity and rarity of the atmosphere, as well as the dryness, being unfavorable for its development and propagation. In densely populated districts, and especially in large cities, the proportion of cases is much greater, regardless of geographical lines. *Race* also has some influence in determining the geographical distribution, as the Negro race, the Indians and the South Sea Islanders, seem to be especially susceptible to the disease.

General Pathology.—The lungs are most frequently attacked. Next in order of frequency is the larynx, and then the intestines, the peritoneum, the genito-urinary organs, the brain and the bones and joints. In children, lymph glands and intestines are most often involved. In all cases, no matter where the disease originally appears, the lungs are usually involved sooner or later. Any organ or tissue may become the seat of tuberculous disease, but the bacilli are most liable to invade the system as above set forth. The local action of the tubercle bacillus upon the tissues results in the proliferation of pre-existing tissue elements of the part infected, due to the local, specific irritant action of the bacilli. "These anatomic products are transformed into epithelioid and giant cells. The epithelioid cells assume

various shapes, chiefly rounded and polygonal; they have vesicular nuclei, and soon show tubercle bacilli in their interiors. A certain proportion of the epithelioid cells, as they increase in size and a repeated division of their nuclei, become *giant cells*. The latter occupy the center of the tubercle, and also contain bacilli, the number of giant cells and of the bacilli being largely reciprocal. Thus, the giant cells are numerous in tubercular lymph glands, joints, etc., in which the bacilli are relatively few; on the other hand, they are scanty in miliary tubercles, in which the bacilli are numerous—two facts that lend support to the view held by many authors, that giant cells display phagocytic action.

“About the site of infection a *diapedesis of leukocytes* occurs in the nature of a defensive inflammatory process. At first the leukocytes are of the polynuclear variety and are quickly destroyed; but later mononuclear leukocytes (lymphocytes) appear. These latter resist the action of the bacilli, and I think their true function is a phagocytic one. The various forms of cells described are connected and surrounded by a reticular stroma ‘formed by the fibrillation and rarefaction of the connective-tissue matrix.’” (Baumgarten.)

“*The fully developed tubercles* are small, nodular bodies whose diameters range from $\frac{1}{2}$ to 2 or 3 mm. At first they are almost transparent, but soon lose this quality in consequence of the further changes described below. They are non-vascular bodies, and invariably undergo (a) *caseation* and (b) *sclerosis*.

“(a) *Caseation*.—This implies ‘coagulation-necrosis’—a destructive process proceeding from the center toward the periphery of the tubercle, and the result of the local action of the bacilli or their chemical secretions. The cells are thus transformed into a uniformly yellowish-gray, structureless matter. When the foci are numerous and close-set, fusion may occur, with the production of larger or smaller homogeneous masses (cheesy pneumonia). The latter may soften, resulting in the formation of cavities; this is due, usually to secondary pyogenic infection, causing ulceration. Less frequently the cheesy masses undergo calcification or become encapsulated. Such masses may remain indefinitely and are practically harmless.

“(b) *Sclerosis*.—Preceding and during the time that cell-destruction is going on in the center of the tubercles the protective forces of nature are asserting themselves, though too often without avail. In the first place, hyaline transformation, with conversion of the cellular elements into fibrous tissue, occurs. Frequently, now, the center of the tubercle is caseous and contains bacilli, while the peripheral parts are quite hard and do not contain bacilli. The fibroid change may

pervade the entire tubercle. Again, the fibroid element in the tissues immediately surrounding the tubercle may be greatly increased and form new connective tissue, and this process be followed by secondary contraction, converting the tubercle into a firm fibrous nodule. The fibroid change in its completest development is observed in tuberculosis of serous membranes, especially of the peritoneum.

“Whether in any given case the destructive forces, on the one hand, or the conservative, on the other, shall come off victorious depends upon several conditions. Though natural immunity is probably unknown, yet under certain circumstances and at certain times tissue-soils may successfully resist bacillary invasion. The bacilli of tuberculosis doubtless produce special toxins, and hence there is a reasonable probability that the tissues and liquids of the body manufacture an antitoxin. The latter agent may therefore constitute one of nature’s chief means of defense. There are also soils that are moderately receptive, and these may become infected, but sooner or later the destruction of the invading parasite may be determined by altered soil conditions—changes induced by nature’s benign and curative efforts. It is probable that in such instances the favorable issue is sometimes to be ascribed to the fact that relatively few bacilli find lodgment, so that the average phagocytic activity and other protective processes suffice. But when the bacilli fall upon a soil that is altogether favorable to their growth, their pernicious influence can not be arrested, since the usual means that turn the scales in favor of a cure are wanting.

“We are now prepared to understand the coarser appearances presented by tuberculous lesions, especially of the lungs. Fusion of minute centers of infection, or of miliary tubercles results in the formation of large nodules or areas, which lead by a process of local extension to *diffuse tuberculous infiltration* (gray infiltration of Laennec). An entire lobe may become similarly involved (tuberculous pneumonia), and ‘there may also be a diffuse infiltration and caseation without any special foci, a widespread tuberculous pneumonia induced by the bacilli.’ (Osler.)

“The term ‘gray infiltration’ is misleading from a pathologic point of view, since the morbid changes differ in no essential manner from those described as occurring in the miliary or nodular tubercle. Moreover, the latter also presents a grayish appearance. The apparent difference between a miliary tubercle and diffuse tubercular infiltration lies in the fact that the latter displays a greater tendency to spread by direct extension.

“**Associated Inflammatory Processes.**—The tubercle bacilli

excite associated inflammatory processes in the organs affected, and if the tuberculous lesions run a slow course, a limited wall of true fibroid induration circumscribes the area involved. By means of this induration, the natural protective forces, either temporarily or permanently, check the progress of the local lesions, and the change is strictly analogous to the sclerosis that takes place in the peripheral parts of the elementary tubercle, or immediately surrounding the latter, as in tuberculosis of serous membranes. On the other hand, when the tuberculous infiltration is less tardily developed, the secondary inflammatory processes may show changes similar to those of catarrhal or croupous pneumonia. It is a noteworthy fact that the constitutional features in tuberculosis are not so much dependent upon the primary as upon a secondary infection, chiefly with the streptococci. The latter are responsible for the serious septic element in the various varieties of tuberculosis (especially pulmonary), and some contend that the tubercle bacilli can excite suppuration directly. The pus, however, in this substance does not contain the streptococci, and is sterile. Mixed infection is, I believe, the rule." (Anders.)

Etiology.—The bacillus tuberculosis, first described in 1881 by Koch, is now definitely proved to be the actual cause of tubercular disease. The bacillus is a short, fine rod having a length equal to one half the diameter of a red blood cell. When stained, it presents a beady appearance, probably due to spore-growth within it. The bacilli are found in all tubercular lesions, but they are more numerous in the acute forms of disease. They may gain access to the blood-vessels or the lymph vessels, and become generally distributed throughout the body. They are thrown off in the expectoration of patients suffering from pulmonary tuberculosis in enormous numbers, and this infected sputum, when allowed to dry, enters the air as a fine dust, which spreads the disease in every direction, and infects rooms, carpets and clothing, and from these may be conveyed back into the atmosphere. The bacilli are very tenacious of life, and can maintain their existence almost indefinitely outside the body. It is the *indoor atmosphere*, laden with bacilli, that is especially liable to excite tuberculosis when breathed more or less constantly. In places only rarely frequented by consumptives the dust is usually free from virulent bacilli.

Modes of infection.—1. *Hereditary or congenital tuberculosis* is very rare, although undoubted cases have occurred, and it has been conclusively shown that the inheritance is much more often from the maternal than the paternal side.

2. *By inhalation.*—The chief mode of infection is by inhalation, the bacilli entering the lungs with the inspired air. It should be borne

in mind, however, that the expired air of tubercular patients is not infective. The pathogenic germs are contained in the dried sputa, and are inhaled from the air in which they float. In this way they enter the system, and may primarily infect the upper air passages or the larynx, but usually find lodgment in the smaller bronchi, or, less frequently, in the lungs. About fifty per cent of all autopsies show the evidence of previous tubercular lesions in the bronchi and lungs. Tuberculosis is a contagious disease, but, unlike other contagious diseases, it is not transferred by a single exposure, but requires repeated and prolonged exposures, for which the chronic course of the disease gives favorable opportunity. Husband or wife may contract the disease from the other, and professional nurses are very liable to the infection. According to Whitaker, seventy-three per cent of nurses up to the age of fifty die of tuberculosis. Prisons, cloisters and asylums show a large proportion of cases, which are becoming less as the contagious nature of the disease is becoming understood and proper sanitary precautions are observed.

3. *By swallowing.*— Infection may take place by the ingestion of infected milk or meat. The milk of tuberculous animals will transmit the disease to their own offspring, as well as to the human family, the bacillus in such instances finding lodgment in the *primæ viæ*; hence the frequency of intestinal and mesenteric tuberculosis in children and young animals. The meat of an infected animal does not often induce the disease, but may do so if the site of a tuberculous deposit is ingested. Thorough cooking is an efficient safeguard against this method of transmission. Experiments have shown that tuberculosis may be communicated by administering the expectoration of tuberculous patients in food.

4. *By inoculation.*— Tuberculosis in the form of local tubercular lesions, may result by inoculation, the disease in such cases being very rarely transmitted by the lymphatics to other parts. Such an infection may occur from infected instruments, or by handling pathological specimens or infected meat or skins; the diseased tissue coming in contact with cuts, fissures or abrasions of the skin. In a similar manner infection may take place from the dissection of the body of a person who has died of tuberculosis. In many cases inoculation has taken place in children during the rite of circumcision, the wound having been sucked by a tuberculous operator. There is no evidence that the disease can be conveyed by vaccination with humanized virus. Osler says that inoculation in man plays a trifling rôle in the transmission of tuberculosis.

Predisposing Causes.— 1. *Race.*— The negro seems especially sus-

ceptible to tubercular infection, and next to the negro in receptivity is the American Indian. Of all other races the Irish seem most liable to the disease, judging from statistics secured in this country.

2. *Hereditary Predisposition.*—While heredity may not be so generally responsible as a predisposing cause of tuberculosis as has heretofore been maintained, nevertheless it is an important factor in the production of the disease. A large percentage of cases can be traced to hereditary influences, so far as predisposition to the disease is concerned. Doubtless the child of tuberculous parents may not, and probably will not, in most cases at least, develop the disease under proper environments, yet they will usually sooner or later succumb, if not given the benefit of proper climatic and sanitary conditions. Persons of a delicate constitution and with weak lung power—the so-called tubercular diathesis—and also those of a strumous diathesis are most liable to the disease, and these conditions are usually due to heredity. On the other hand, it must be borne in mind that apparently strong and robust people are sometimes victims of the disease. Many years ago I was called to treat for tuberculosis the oldest son (aged 26) of seven children, all of these save the youngest being giants in size and strength, and all of them up to that time in apparent robust health. The father and mother were large, strong and perfectly healthy. The youngest child was a puny little girl with apparently no strength or constitution. At the end of four years the six older children had all died with tuberculosis. The puny girl showed no signs of infection, and grew up to be a strong, healthy woman.

Possibly some cases of supposed hereditary origin are due to accidental infection consequent upon close living with tuberculous parents. The transmission of the disease is more frequent where the mother is the tuberculous parent; how far this is due to prenatal influences can scarcely be estimated.

3. *Age.*—No age is exempt. Pulmonary tuberculosis is more common between twenty and thirty. In children tuberculosis of the bones, the lymphatics, the meninges and the intestinal tract is much more frequent than in adults.

4. *Sex.*—Females are apparently more liable to the disease than males. Pregnancy is a predisposing factor, the disease being accelerated during pregnancy and lactation. Females are more exposed to contagion than males, because they are more closely confined indoors, which also causes them to lack the healthful, invigorating influences of an outdoor life.

5. *Climate and Soil.*—Cold climates where there is great humidity and sudden changes of temperature, are most favorable to the develop-

ment of tuberculosis, whereas cold, dry climates and mountainous districts are usually remarkably free from the disease.

6. *Occupation*.—Persons employed in occupations that require them to be housed in poorly ventilated rooms, or where they are subject to irritating or noxious inhalations, are more liable to tuberculosis than those who are free from such weakening and contaminating influences.

7. *Local Conditions*.—Any part of the system weakened by disease, or subject to inflammation, is more susceptible to tubercular infection. Any local catarrh, but more especially bronchial catarrh, an unresolved pneumonia, injuries to the chest, etc., may act as predisposing causes. In a like manner intestinal catarrh predisposes to tuberculosis of the alimentary tract, or at least creates a soil more favorable to the growth of the bacilli. Simple synovitis from an injury may become tubercular.

ACUTE PNEUMONIC PHTHISIS.

Synonyms.—Acute Pulmonary Phthisis, Acute Consumption, Galloping Consumption, Phthisis Florida.

Pathology.—Acute pulmonary phthisis means pulmonary tuberculosis plus lobar pneumonia or broncho-pneumonia, and is, therefore, a more complex disease than simple tuberculosis. The apex of the lung is usually first affected, the upper lobe and sometimes the whole lung becoming involved within a comparatively short time. In some cases, especially those associated with broncho-pneumonia, the disease is distributed here and there throughout both lungs, the lower lobes being often involved.

Two forms are recognized: (1) With lobar pneumonia; (2) with broncho-pneumonia.

1. *With Lobar Pneumonia*.—A destruction of lung tissue takes place and cavities result. These are usually small and surrounded by unbroken tubercular nodules. The latter may break down, and thus the size of the cavities be increased. These nodules consist of tubercular dead or necrotic tissue, and can never undergo resolution. In a few cases softening and cavities are not present, but more or less of the lung becomes consolidated, consisting of a dry, yellowish-white cheesy substance which remains to the end. The surrounding lung tissue is pneumonic with either red or gray hepatization.

2. *With Broncho-pneumonia*.—This form is more commonly met with, especially in children. The changes are those found in a broncho-pneumonia. They occur in patches, a bronchus with infiltrated walls being surrounded by a zone of consolidated air cells. These patches may coalesce, and form large areas of consolidation. These break down, and thus are formed cavities varying greatly in form and size.

In most cases the pleura are involved, and, especially in children, the bronchial glands are also infected.

The bronchial wall may become weakened by the tubercular infiltration and dilatation occur, and this may be followed by ulceration of the bronchial wall.

Etiology.—Acute phthisis may be either primary or secondary to some previous tubercular disease of the lungs or some other organ. It occurs oftenest during childhood and early adult life, but no age is exempt.

Symptoms.—The onset is sudden. Usually after exposure to cold, but often without, the patient has a chill followed by a rapidly rising temperature, pain in the side, cough with mucous or muco-purulent expectoration, and much prostration. Subsequently the expectoration becomes rust-colored and sometimes contains tubercle bacilli, but these may be absent until later in the disease. Hemorrhage is often present during the first day or two and is sometimes quite severe. Dyspnea, sometimes extreme, is an early and constant symptom. The temperature is often continuously high, but usually is remittent or hectic in type. Night sweats and rapid emaciation are almost invariably present. The physical signs are those of lobar pneumonia, and in the early stages the real character of the disease is usually not suspected. About the eighth or tenth day, instead of the crisis occurring, the patient is worse. The temperature becomes distinctly remittent, the pulse more rapid, the expectoration muco-purulent and of a greenish color. These symptoms gradually become more severe, the physical signs of softening are present, and the tubercle bacilli are abundant. It is often only at this stage that the nature and gravity of the case is fully realized. In some instances death occurs before softening has taken place.

In some cases the course is subacute, the onset being gradual, sometimes preceded by hemoptysis. There are repeated chills followed by a high fever of a remittent type, with rapid pulse and rapid respiration, but dyspnea is rarely distressing. The cough is at first dry, but later there is a muco-purulent expectoration, soon becoming abundant and purulent and containing tubercle bacilli and occasional hemorrhages, being sometimes quite profuse. The fever is generally about 100° F. in the morning, with an afternoon exacerbation to 103° or 104° F. The remissions always occur in the early morning hours. They are accompanied by profuse cold sweats, more especially about the head and the neck. During the exacerbation of the fever the cheeks are flushed and the eyes are bright. The pulse gradually becomes more rapid and feeble; the breathing more and more rapid,

though there is rarely any complaint of dyspnea even if cyanosis be present, which is sometimes the case. The patient rapidly loses flesh and strength and becomes anemic. The physical signs at first are those of general bronchitis, or broncho-pneumonia, frequently with evidences of pleurisy. When cavities form, there is obtained tympanitic dullness or a "cracked-pot," or even an amphoric note; the breathing and the voice become cavernous, and the well-known gurgles and churning râles make their appearance.

Diagnosis.—In the class of cases first described, lobar pneumonia is the only disease offering any difficulty in differentiation. The chief diagnostic points have already been given under the head of Lobar Pneumonia. In subacute cases with a gradual onset there may be some difficulty in distinguishing from non-tuberculous broncho-pneumonia and bronchiectasis. From broncho-pneumonia it is distinguished chiefly by the signs of softening and the presence of the tubercle bacillus in the sputum. In bronchiectasis the absence of the characteristic fever of phthisis, of the tubercle bacillus in the sputum, the slower course and less emaciation and constitutional disturbances are sufficient for differentiation.

Acute tuberculous broncho-pneumonia is referred to by Osler as most commonly following infectious diseases, particularly measles and whooping cough, a majority of such cases being tuberculous. He recognizes three groups of cases: (a) Those in which the child suddenly becomes ill while teething or during convalescence from fever, with high temperature, severe cough, and the signs of consolidation of one or both apices. Death may occur within a few days. To the naked eye, the lesions do not appear to be tuberculous. (b) In this group the children show the ordinary symptoms of broncho-pneumonia, and the cases are more protracted, death occurring about the sixth week. (c) The child feels ill during convalescence from an infectious disease, fever, cough and dyspnea being present. The intensity of the symptoms abates within a fortnight, and the physical examination shows the presence of diffuse bronchitis with scattered minute areas of consolidation. Many of these cases develop into chronic phthisis.

CHRONIC PULMONARY TUBERCULOSIS.

Synonyms.—Tuberculosis, Consumption, Chronic Phthisis, Chronic Ulcerative Phthisis.

Definition.—A chronic pulmonary disease caused by the bacillus tuberculosis, resulting in the deposition of tubercle in the lung structure, which in turn undergoes ulceration and softening, in most cases resulting in septic infection from purulent foci and cavities, thus

presenting the symptoms of a mixed disease, sepsis being superadded to tuberculosis.

Pathology. — The general pathological features of tuberculosis have already been described. The deposit of the tubercle usually first takes place at the apex of one lung, a short distance below the summit and posteriorly, and the disease progresses downward. Sooner or later the disease attacks the upper lobe of the opposite lung, and at the same time progressing downward and involving the upper part of the lower lobe of the lung primarily affected. In very rare cases the disease first attacks the lower lobe.

According to Anders's observations the "initial lesion is frequently located anteriorly and near the apex, corresponding on the chest walls to the clavicle and the suprclavicular spaces. This site has seemed to me to obtain more often on the right side than on the left." The lesions in chronic tuberculosis resemble those of the acute form plus an interstitial pneumonia. The tubercular nodules appear as in acute phthisis, and may undergo coagulative necrosis or break down and form cavities. In the few cases where recovery takes place, they undergo a fibroid change, or, perhaps more often, become encapsulated with calcareous or cheesy contents. The surrounding tissue may be consolidated or infiltrated with tubercular tissue. These changes usually start in the smaller bronchi, and are first confined to certain lobules, but may later extend and involve large areas of lung tissue. The softening and formation of cavities are associated with an ulceration of the bronchial walls which further increases the size of the cavities. Dilatation of the walls may also occur, causing bronchiectasis, which also adds to the size of the cavities. The cavities once formed tend to enlarge, and, as they consequently coalesce, larger cavities are formed until the whole lobe or even an entire lung may be converted into a single large cavity. The walls of the cavities are irregular in shape. Erosion of the walls of the arteries occurs with consequent more or less profuse hemorrhage, unless, as is often the case, an obliterating endarteritis occurs, in which case the vessel is converted into a fibrous cord. Small cavities, and even those of a moderate size, but never large cavities, may undergo conservative and healing processes, their walls becoming thick and fibrous and their lining smooth, resembling a mucous membrane.

Interstitial Pneumonia. — Two forms of interstitial pneumonia are recognized in connection with chronic tuberculosis. The first of these is an inflammatory consolidation resulting from the direct irritation of the bacilli. This form is destructive in its tendency, and favors the extension of the tubercular process. The second form is of an

opposite character. It develops slowly in close proximity to the tubercular masses and cavities, and aims to retard the progress of the disease, and repair the injury already done. Cicatricial connective tissue is formed which limits the extension of cavities, and by causing contraction may cause a partial or complete obliteration.

Disseminated Tuberculosis. — Miliary tubercles are found not only in the diseased area, but also throughout a whole lobe or the entire lung. These tubercles undergo caseation. Fusion may take place and thus as a consequence, large, irregular-shaped cavities result. The presence of miliary tubercles may lead to a widespread tuberculous pneumonia. In this form miliary tubercles are also found in other organs and tissues throughout the body.

Changes in Other Organs. — Tubercular changes are often found in the pleura, the larynx, the bronchial glands, and in the mesenteric and other lymph glands. Tuberculous endocarditis is not very uncommon. Intestinal tuberculosis with consequent diarrhea occurs in advanced cases. Amyloid change is often found in the liver, spleen, kidneys and the intestinal mucous membrane. Fatty infiltration of the liver with marked enlargement is not unusual.

Symptoms. — The mode of onset is varied and usually insidious, but may be abrupt.

1. The most common mode of onset is through an ordinary "neglected cold" with a persistent and often-recurring bronchitis. The latter may also follow an ordinary severe attack of influenza, or measles or whooping cough. An intractable bronchial cough, especially in young persons, should always excite suspicion.

2. There may be a dry pleurisy at the apex, usually with symptoms of an associated bronchitis, or less often a pleurisy with effusion. According to Bosoditch, one third of the cases of pleurisy with effusion ultimately terminate in chronic phthisis. The proportion is greater where there is double pleurisy with effusion.

3. The disease may begin with symptoms of dyspepsia and anemia in those who have previously had feeble digestion. They become anemic, emaciated and greatly debilitated. Later the indications of tuberculosis develop in the lungs. In women amenorrhea is an early symptom in such cases.

4. The disease may begin with laryngeal symptoms — huskiness of the voice, more or less aphonia and a characteristic laryngeal cough, with scanty muco-purulent expectoration. Examination may reveal the tubercle bacilli before the lungs are involved. This is said to be a rare form, but I have seen many cases.

5. Chills and fever sometimes usher in the disease, and these, especially in malarious districts, are often mistaken for those of malarial origin.

6. Hemoptysis may be the initial symptom, preceding other manifestations of the disease by months or even by years, though in such cases a tuberculous lesion is probably present before the occurrence of the hemorrhage.

7. According to Anders the most important group under this category "is heralded by the symptoms and signs of *acute pneumonia*, more commonly of the lobular variety. As compared with ordinary pneumonias, these present some peculiar features: the fever is irregular and the expectoration is more abundant, is blood-stained, and contains bacilli. The signs are usually located in the apical region. Resolution may occur, but recovery is not complete, and the condition is likely to pass into chronic phthisis." The symptoms correspond closely to the stages of deposition, of softening, septic infection, and of the formation of cavities. Osler prefers to divide the symptoms into (1) *Local* and (2) *General*.

1. *Local*.—*Pain* may be a distressing symptom, or it may be absent entirely. When present, it is due either to the pleurisy, to the muscular strain of coughing, or to intercurrent intercostal neuralgia. *Cough* is an early and almost a constant symptom. Dry and hacking at first, it later becomes looser and more frequent. It may be so distressing as to prevent sleep, and sufficiently severe and paroxysmal to promote vomiting, and thus to interfere with the patient's nutrition, but the severity of the cough is no reliable indication as to the extent of the pulmonary lesions. The sputum varies in amount and character in the different stages of the disease. At first the expectoration is mucous and of a glairy consistency, presenting nothing suggestive of tubercular trouble. Later in the disease the sputum becomes mucopurulent, and contains little grayish or grayish-green lumps. When cavities form, the expectoration is more profuse, especially in the morning or after sleep, is more purulent, and finally the sputa assume the nummular form of separate solid purulent masses which sink in water. The expectoration of phthisical patients has usually a heavy sweetish odor, although it may be fetid. In cases of consolidation without much bronchitis the sputum may not be abundant at any time. Generally the quantity of the sputum gives a fair test of the activity of the disease. Examination of the sputum for tubercle bacilli should always be made in doubtful cases. The bacilli are usually present early in the disease; they are abundant in proportion to the intensity of the tubercular process. A diminished number of bacilli affords grounds

for a more favorable prognosis. The presence of bacilli in the sputum is an infallible proof of the existence of tuberculosis, but their absence does not necessarily exclude the disease. Tuberculosis can be excluded only after repeated examinations of the sputa show absence of the bacilli.

The demonstration of elastic fibers in the expectoration only proves the existence of some destructive pulmonary lesion, the fibers being found in tuberculosis, gangrene, and abscess of the lung. If the sputum be pressed between two thin cover-glasses, and held against a black background, the elastic fibers can usually be recognized with the naked eye. From the appearance of the elastic fibers it can be told whether they are derived from the bronchi, the alveoli, or the blood vessels. (Osler.)

Hemorrhage is present in a majority of cases, and may appear either early or late in the disease. The amount of blood expectorated varies widely, as does also the frequency of its occurrence. Early hemorrhages never cause phthisis, as is sometimes supposed, but are due to small unsuspected lesions. Small early hemorrhages usually arise from the congested or ulcerated walls of the bronchi, and the blood is admixed with sputum. Large late hemorrhages arise from the erosion of an artery, or from a ruptured aneurysm of an artery within a cavity; in these cases the blood is profuse, and is unmixed with sputum.

Small hemorrhages from congested bronchi may relieve congestion, and may be followed by a feeling of general improvement. Large hemorrhages are often fatal, either from the exhaustion and anemia induced by them, or by reason of the hemorrhage itself, or because blood is aspirated into the bronchi of the other lung, causing asphyxia or septic pneumonia.

Dyspnea is usually present, but is not a constant symptom. The respirations are moderately increased in all cases, and only become rapid from the presence of a broncho-pneumonia, or the development of miliary tubercles. Constant dyspnea usually indicates excessive involvement of both lungs or points to some plural complication. Extreme dyspnea with cyanosis is practically unknown in complicated cases. Pain and sudden urgent dyspnea suggest pneumothorax.

2. *General Symptoms.*—Fever is the most important initial symptom, and usually represents a corresponding advance in the lesion. A continuous normal temperature generally indicates that the disease is not progressing. Frequent observations should be taken, as a night-and-morning-temperature record rarely gives either the minimum or maximum. Frequently consolidation gives no increase in temperature, though a coexisting bronchitis may cause an elevation, or it may

indicate an acute pneumonia. A regular increased temperature is generally present, if any, during the initial stage of the disease. The fever is usually remittent or even intermittent, the minimum temperature occurring between 2 and 6 o'clock A. M., the maximum being noted between 2 and 6 o'clock P. M. In the early stages, the highest temperature may occur about 4 or 5 P. M., and the lowest about 4 or 5 A. M. The fever is more often remittent during the middle stage, and intermittent during the stage of cavity formation, though the latter may be present earlier and give rise to an error in diagnosis, especially in malarious districts. The afternoon rise of temperature is usually accompanied with flushed face, brilliant eyes, and a "hectic flush." The early morning remission is marked by profuse cold night sweats, especially about the head and the neck. The sweating in advanced cases also recurs during the day, after sleeping. When extensive suppurating cavities exist, the morning temperature may be subnormal. The pulse is full and rapid, but soft and easily compressed. Later, when suppuration is extensive, the pulse becomes small, rapid and easily compressed, and capillary pulsation may be visible under the finger nails.

Emaciation is an ever-present and progressive symptom, the thorax and extremities being most affected. As a rule, the weight gives a good index of the progress of the disease. Extreme emaciation is always reached before the end of the disease. Anemia and general debility are characteristic and present in all cases.

Mental despondency is almost unknown, the patient retaining a remarkable cheerfulness of mind, even to the last, expressing a firm confidence in speedy recovery.

Physical Signs.—Inspection.—In the first stage, there are often slight depressions in the supraclavicular, and at times in the infraclavicular regions. There is defective expansion at one apex, which is often better estimated from a point behind the patient. Various types of chest formation are laid down for phthisical patients, and most cases will, in a general way, show a narrow and flattened chest; tuberculosis may be found in chests of any build.

Palpation.—Usually palpation will show a diminished respiratory expansion at one apex at a very early stage, and before other physical signs are manifest. This is of great diagnostic importance.

"Deficiency in expansion at the apices or bases is perhaps best gauged by placing the hands in the subclavicular spaces, and then in the lateral regions of the chest, and asking the patient to draw slowly a full breath. Standing behind the patient, and placing the thumbs in the subclavicular and the fingers in the infraclavicular spaces, one can judge accurately as to the relative mobility of the two sides. On asking the

patient to count, the tactile fremitus is increased whenever there is local growth of tubercle or extensive caseation. In comparing the apices, it is important to bear in mind that normally the fremitus is stronger at the right than at the left. So, too, at the base, when there is consolidation of the lung, the fremitus is increased; whereas, if there is pleural effusion, it is diminished or absent. In the later stages, when cavities form, the tactile fremitus is usually much exaggerated over them. When the pleura is greatly thickened, the fremitus may be somewhat diminished." (Osler.)

Percussion.—At an early stage the percussion note may be slightly impaired, the dullness gradually increasing as consolidation advances. It is usually first noticed above the clavicle. If the consolidated areas are minute, however, the percussion note may be unchanged, and as the air cells surrounding the latter are often emphysematous and relaxed, the note may be somewhat tympanic. In many cases the tympanic sound and deadness are intermingled, giving rise to the so-called tympanic deadened sound. Slight dullness is, as a rule, noted first below the clavicle, though in not a few cases it is first detected upon and above the clavicle. The corresponding regions of the two sides must be compared during a held inspiration, and also during a held expiration. Late in the disease there is pronounced dullness, with circumscribed spots, giving a tympanic or "cracked-pot" sound. In old cases, with extensive fibroid changes, a wooden sound may be obtained.

Auscultation.—In the early stage only feeble breathing may be noticed, or the inspiration may be inaudible or jerky, and the expiration much prolonged, the latter being an important diagnostic symptom. At first the pitch is sharpened, and later distinctly bronchial. Subcrepitant râles are often heard in an early stage, or the respiratory murmur may be rude and harsh, especially on deep breathing, sometimes described as the cog-wheel breathing. It is always best to compare the corresponding regions on the two sides. In the second stage there is vesico-bronchial breathing, the sounds being louder and higher pitched than normal, with an expiration longer and higher in pitch than inspiration. Subcrepitant and large and moist bubbling râles are heard. Vocal fremitus is usually increased unless there be thickened pleura. These physical signs are distinctive when obtained at the left apex, but are nearly the signs normally obtained at the right apex, the presence of bronchial and subcrepitant râles, however, not being normal to either apex, may make the diagnosis evident. Later, when consolidation becomes more marked, the dullness becomes more pronounced, the breathing and the voice become bronchial, vocal

fremitus is increased, and the bronchial râles become coarser and more numerous. Pleuritic friction sounds may be present at any stage. They may be heard early, and are sometimes a marked feature throughout. Pleuro-pericardial friction is heard when the lappet of lung over the heart is involved, and, if consolidated, clicking râles are present, due to the heart's systole. A cardio-respiratory murmur—a whiffling systolic bruit, caused by the forcing of the air out of the tubes by the impulse of the heart, is often heard. Bronchophony and less often pectoriloquy are present over areas of consolidation and over cavities.

Osler thus describes the signs of cavity: “When there is not much thickening of the pleura or condensation of the surrounding lung tissue, the percussion sound may be full and clear, resembling the normal note. More commonly there is defective resonance or a tympanitic quality which may at times be purely amphoric. The pitch of the percussion note changes over a cavity when the mouth is opened or closed (Wintrich's sign), or it may be brought out more clearly on change of position. The cracked-pot sound is only obtainable over tolerably large cavities with thin walls. It is best elicited by a firm, quick stroke, the patient at the time having the mouth open. In those rare instances of almost total excavation of one lung, the percussion note may be amphoric in quality. On auscultation the so-called cavernous sounds are heard: (1) Various grades of modified breathing—blowing or tubular, cavernous or amphoric. There may be a curiously sharp hissing sound, as if the air was passing from a narrow opening into a wide space. In very large cavities both inspiration and expiration may be typically amphoric. (2) There are coarse bubbling râles which have a resonant quality, and on coughing may have a metallic or ringing character. On coughing they are often loud and gurgling. In very large thin-walled cavities, and more rarely in medium-sized cavities, surrounded by recent consolidation, the râles may have a distinctly amphoric echo, simulating those of pneumothorax. There are dry cavities in which no râles are heard. (3) The vocal resonance is greatly intensified and whispered pectoriloquy is clearly heard. In large apical cavities the heart sounds are well heard, and occasionally there may be an intense systolic murmur, probably always transmitted to, and not produced, as has been supposed, in, the cavity itself.

“Pseudo-cavernous signs may be caused by an area of consolidation near a large bronchus. The condition may be most deceptive—the high-pitched or tympanitic percussion note, the tubular or cavernous breathing, and the resonant râles, simulate closely those of cavity.”

Diagnosis.—The early diagnosis of tubercular phthisis is usually quite difficult, and rests mainly on the history, together with the symptoms and physical signs. In the first stage it is often mistaken for dyspepsia, anemia, malarial fever, or disease of the heart. Later in the disease the characteristic physical signs and the presence of bacilli in the sputum renders the diagnosis comparatively easy and infallible. Osler urges the early and frequent examination of the sputum for bacilli, and well remarks that "early detection is of vital importance, as successful treatment depends upon the measures taken before the lungs are extensively involved." It is, however, true that an absence of bacilli does not justify a denial of the existence of phthisis. (Anders.) The symptoms and physical signs must always be carefully considered. The presence of elastic fibers in the sputum indicates destruction of lung tissue. It is sometimes found early, and is always of great diagnostic importance.

Prognosis.—The prognosis is grave, but not altogether hopeless, though it is doubtful if advanced cases are ever cured. The disease may, under the influence of proper treatment, favorable hygienic surroundings, and an equable climate, become arrested in its course, and the patient be considered as cured, but there is always danger of a fresh outbreak of the latent disease. This, however, does not always occur, and patients live for many years, finally dying from some other disease. Spontaneous cures sometimes take place under the most disadvantageous circumstances, and are not to be accounted for. Such cases afford the charlatan and quack, including faith healers and Christian scientists, excellent opportunities to "prove" the efficacy of their various methods. In most cases, if not too far advanced, proper treatment and change of climate will arrest the disease. Much, however, depends upon the constitutional vigor of the patient, the extent of the lesions, and the rapidity of their development.

FIBROID PHTHISIS.

Fibroid phthisis is a condition of induration followed by contraction of the lung tissue, due to an increase in the connective tissue elements. It constitutes a tuberculous interstitial pneumonia, and is clinically identical with chronic interstitial pneumonia, elsewhere considered. Patients suffering from the latter disease are especially liable to tubercular infection, which superadded to the primary disease constitutes fibroid phthisis. Often it is quite impossible, unless the bacilli are found in the sputum, to determine positively the presence of tuberculosis. The pathology, symptoms and physical signs are those of chronic interstitial pneumonia, plus more or less of the

characteristic features of chronic pulmonary tuberculosis, as already described. Fibroid phthisis usually follows an arrested tubercular pulmonary lesion, or a chronic tuberculous pleurisy, a broncho-pneumonia or pneumonokoniosis. For a detailed description, see Chronic Interstitial Pneumonia.

Treatment of Pulmonary Tuberculosis.

The treatment of pulmonary tuberculosis may be considered under the following heads: (1) Prophylactic; (2) Climatic; (3) Hygienic; (4) Medicinal.

1. *Prophylactic.*—Since the demonstration of the bacterial origin of tuberculosis, the preventive treatment of the disease has assumed added importance, both to the individual patient and to the general public. The sputum should always be collected and burned. Patients should be warned never to expectorate about the house, on the street, or in any public place. They should always use a cup designed for that purpose, or spit-cloths or handkerchiefs, the former to be burned and the latter thoroughly boiled after use. Persons known to have tuberculosis should occupy separate sleeping rooms, and care should be taken that all parts of the house are well ventilated. Tuberculous patients should never marry, and a tuberculous mother should neither suckle her babe, nor sleep in the same room with it. A child born of tuberculous parents should receive special attention as to its care and future habits. It should spend as much time as possible in the open air and sunshine, being at all times well clothed and carefully fed. It should not be allowed to indulge in overstudy, especially in a crowded schoolroom, its education being best sacrificed for athletic pursuits. Catarrhal affections of the upper air passages, nasal obstruction from any cause, and enlarged tonsils should receive prompt treatment. For the benefit of the general public there should be a rigid inspection of milch cows and of cattle for slaughter, and all infected animals killed.

2. *Climatic.*—The climatic treatment of pulmonary tuberculosis is one of great importance to all who are financially able to take advantage of it. Unfortunately it is not always possible to prescribe exactly the climate best adapted for each individual case. Nevertheless a suitable change of climate affords the best chance for a permanent recovery to those in whom the disease is not too far advanced. Even far advanced and apparently hopeless cases sometimes recover, but in a majority of instances such is not the case, and it is certainly cruel to send hopeless and even dying patients away from friends and home comforts to die among strangers.

Some twenty years ago I was called to see an advanced case, appar-

ently near the end. Adynamic symptoms were present, and it seemed that the patient could live but a few hours. In spite of my protest she was placed in a sleigh (during bitter cold weather), and taken to the station eight miles distant. There she was placed on the train and taken to Denver. She not only survived the journey, but recovered and lived a comfortable life for fifteen years, when, from contracting a cold, the disease redeveloped, and she died in a short time.

Speaking in a general way, the requirements of a climate are a pure atmosphere, little humidity, equable and moderate temperature, altitude and abundant sunshine. As a rule, a maximum temperature is best, but some cases do better in a cool climate. So also a dry atmosphere is desirable in most cases, but some require moisture. The rarefied atmosphere of a high altitude is often desirable but not necessarily so, as is shown by the excellent beneficial results frequently obtained at lower levels. Especially do the aged, weak, nervous, gouty or rheumatic and those suffering from cardiac disease, do better in the lower altitudes. Forests, and particularly pine groves, are beneficial. They not only temper the atmosphere, favoring equability of both temperature and relative humidity, but they also generate ozone, which oxidizes any impurities that may be contained in the air. With all these factors to consider, it is plainly evident how difficult it must be to select the proper climate for a given case. I think the best all-round climate for consumptives is found in Arizona and New Mexico, where an open-air, tent life can be maintained the year round. Young and robust patients with early lesions do best usually in a cold, bracing climate, where they can lead an active outdoor life, and become strong and muscular. Such cases do well in the Adirondacks or in Colorado. Cases not far advanced and who make much of the benefits of society and home comforts, or who desire to earn a livelihood, may do well in southern California or southern Georgia. If by reason of age or infirmity patients can not take much exercise, and need a warm, dry, equable climate, where they can sit outdoors and keep from catching cold without being obliged to exercise, they may be sent to Arizona, southern California, North Carolina, Georgia, Florida, Mexico, Egypt and Algeria. The more unable such patients are to exercise, the warmer the climate they seem to need, and of late I send all such patients to Arizona. If in such cases there is any reason to believe that moisture is essential, Florida would be most desirable. In cases where laryngeal or bronchial symptoms are well marked, too much can not be said in favor of the highly ozonized and terebinthinized atmosphere of pine forests. In cases with bilateral disease and the presence of cavities, a warm climate is best. Unfortunately there are

many who can not afford a change of climate. For the benefit of such, Anders suggests improvising a home sanitarium "by stocking living apartments, preferably those having a southern exposure, with growing plants. The beneficial influences arising from the presence of the latter are ascribable to two functions—the generation of ozone, and transpiration. Such a pleasant retreat furnishes a uniform degree of moisture in the air, and is especially adapted to the winter season. During the midsummer months, the patient should live out of doors or in the balmy air of a neighboring forest."

Gatchell recommends that "if the patient can not leave home, provide an upper piazza or balcony, inclosed only by wire screen, with southern exposure when possible, and on this let him live and sleep, even in cold weather, when it is not storming. Depend upon bed-clothing to retain body heat while sleeping. The sleeping room should be always cool, with open window when it is not storming." The same author emphasizes the value of a continual life in the open air. The patient should live in the open air. Camp life is best; or, travel on wheel or in the saddle, from place to place. If living in a house, the sleeping couch should be on an upper piazza, protected only by wire screen. Neither cough, fever, night sweats, nor hemoptysis, contraindicate open-air exposure. In summer, let the patient be out 11 or 12 hours; in winter, 6 or 8 hours. If the patient is weak, place him in a reclining chair, in the sunshine, on a balcony, veranda, or on the lawn. Protect, from feet to head, with shawls or wraps, when cool weather demands. Nothing equals camp life to restore the pulmonary invalid. Recovery will follow this method when all others may fail.

3. *Hygienic*.—The absolute necessity of an abundance of fresh air and sunshine has already been suggested, and can not be too strongly advocated. Exercise in the open air should be regulated according to the physical condition of the patient, never being carried to the point of more than moderate fatigue. Exposure to inclement weather should be avoided, but not to the extent of "over-coddling" the patient, thus rendering him more susceptible to colds. The hygienic measures suggested as prophylactic should always be considered. Wool underwear of graduated weights should be worn the year round, but it is harmful to keep a patient loaded down with heavy clothing when the weather does not demand it. Systematic breathing exercises are beneficial in stimulating the nutrition of the respiratory muscles and expanding the lungs. Gatchell gives the following excellent suggestions: "Practice (a) *abdominal* and (b) *costal* breathing. *Abdominal*.—With all clothing perfectly free, lie upon the back, on a firm, level

surface; expel the air from the lungs, and depress the epigastrium to its extreme limit; then fill the lungs, causing the epigastrium to rise, making as great an excursion as possible. Repeat this ten times. Exercise in this way several times daily. *Costal breathing*.—The best way to develop the upper part of the chest is by exercises with two rings suspended from the ceiling by ropes. They should be on pulleys, so as to be adjusted to different heights. (a) With the rings on a level with the shoulders, let the patient grasp the rings with the hands; with the feet fixed; lean far forward, extending the arms outward and backward, *at the same time gradually inflating the lungs as the motion is made*. As the body is drawn back to the erect position, *expel the air from the lungs*. Repeat this many times. (b) Raise the rings above the head. Slowly draw the body up on tiptoe, and let down again, inhaling and exhaling as the two motions are made. (c) Many times daily, when in the open air, go through with *this* exercise: Place the hands on the hips, the fingers forward and the thumbs backward; stand erect, and throw the shoulders and elbows well back; inflate the lungs fully, beginning by abdominal expansion, and extending to the upper chest; close the glottis; hold for a moment. While holding the air in the lungs, make forcible effort at retraction of the abdominal muscles, pressing the diaphragm upward. Then suddenly and forcibly expel the air. Do this many times daily. Continue all these exercises for years after recovery."

The *diet* should be simple, generous and nutritious, the food being adapted to the digestive peculiarities of the patient. As a rule albuminous articles, as milk, eggs and the lighter forms of meat, together with fats, can be taken freely. The hydrocarbons are urgently needed, but they must be taken with care lest they derange the digestive function. If the appetite is poor and the patient has little or no desire for food, it may become necessary to resort to systematic feeding, giving a small quantity of nourishment, such as milk, meat-juice, egg-white, and the like, at stated intervals. When patients suffer from night sweats, it is an excellent plan to awaken them at the usual hour when the sweat occurs and give a glass of warm milk or malted milk. This will often prevent the sweat. It is also a good plan to give a glass of warm milk or malted milk at bedtime. Even forced feeding may be required. Cod liver oil is unquestionably a desirable article of food, and should be prescribed in all cases where it does not disagree. In the latter event it may be given combined with some malt preparation. When gastric irritability becomes a serious complication, the treatment of chronic gastric catarrh should be adopted even to the extent of employing daily lavage. The use of alcohol is very strongly condemned by many.

I have seen some wonderfully beneficial results from its use; but at the same time, it is best to avoid alcoholic liquors unless especially indicated by a loss of appetite, feeble digestion, and a weak, rapid action of the heart. Malt liquors are often beneficial. In advanced cases brandy or whisky may be used freely if they do not disagree. They are particularly beneficial in the morning hours when there is a subnormal temperature.

4. *Medicinal*.—Of all the measures entering into the treatment of phthisis, the medicinal are of least value, yet can not be entirely ignored. Under this head we might first refer to the many specific methods that have been brought to the notice of the public within the past few years. They have all promised much at the outset, and were gladly welcomed, but have without exception proved to be of no value whatever. Koch's tuberculin gave great promise, but has proved a serious disappointment, being not only useless, but positively harmful. Many drugs have been lauded as possessing a specific influence upon tuberculosis, but they have invariably failed in fulfilling expectations. There is no specific treatment for any disease, tuberculosis not excepted. *Creosote* is the only remedy, vaunted as a specific, that has been proved by experience to possess any therapeutic value whatever, and even this is denied by many excellent observers. The drug is not only given in material doses internally, but is also used as an inhalant. The favorite method is to have the patient wear continuously a perforated zinc inhaler (Robinson's) kept moistened with equal parts of alcohol, chloroform and creosote. I have never seen the slightest benefit from this method of treatment. However, in this connection, I wish to mention the use of medicated hot air,—which I have employed for several years in the treatment of all respiratory diseases, including tuberculosis, and with gratifying results. By this method the patient not only obtains the germicidal effects of the hot air, which can be readily inhaled at a temperature of from 300° to 500° F., but they also derive whatever benefit there may be from the direct application of the drug to the diseased surfaces. Any medicine may be used, but in tuberculosis, I always employ pure beechwood creosote. Others may prefer iodoform, guaiacol, terpin hydrate, eucalyptol, etc. I use the "Triumph" apparatus, which is very simple and can be easily managed by the nurse or patient.

With the exception just named, the medicinal treatment of pulmonary tuberculosis is purely symptomatic and palliative. The indicated homœopathic remedy should be carefully and persistently prescribed at all times, and will do more to arrest the disease and palliate the various conditions that arise than so-called specific medi-

cation, or any other method that has yet been devised. I would not, however, reject any simple palliative measures that might bring temporary comfort to the patient, as, for instance, in the cough, which may often be relieved by the use of glycerine, flaxseed, or rock candy and whisky. Night sweats may sometimes be mitigated by sponging the patient with vinegar and water, or acetic or sulphuric acid and water to which a little cologne may be added. A drink of hot milk given shortly before the hour for the sweating to begin is often of great benefit. The fever is often mitigated by a tepid sponge bath and complete rest in bed during the pyrexia. So also, if the cough becomes very harassing and remedies do not control it, *Codeine* may be given in $\frac{1}{10}$ gr. doses. The latter may also be given in solution, two grains to one-half ounce of water, three to six drops at bedtime. It should be used cautiously, never giving over ten drops of the solution at a dose, reducing the dose at the end of a week, and soon omitting it altogether. Heroin in doses of $\frac{1}{4}$ of a grain is highly lauded of late. This is a new preparation of opium, and clinical experience in its use is as yet not very extended.

Gatchell recommends *R. Codeinæ*; Ammon. Chlor. aa grs. viij; Syr. Prun. virg. oz. iv. m. Dose 1 dr. every four hours.

For the night sweats *Atropin* $\frac{1}{80}$ gr. may be given hypodermatically, or *picrotoxin* in doses of $\frac{1}{80}$ of a grain at bed time, or *oxide of zinc* in two to four grain doses at bed time. However, in most cases, the homœopathic remedy will prove efficacious and all-sufficient.

Therapeutics.—*Constitutional Remedies.*—*Ars.* (3x), *Ars. iod.* (2x), *Calc. carb.* (6x), *Calc. iod.* (2x), *Calc. phos.* (3x), *Ferr.* (3x), *Ferr. iod.* (3x), *Iodine* (2x), *Kreos.* (2), *Phos.* (3), *Sulph.* (6x).

Fever.—*Acon.* (3x), *Chin. ars.* (2x), *Cinch.* (2x), *Chin. sulph.* (1x), *Ars.* (3x), *Ars. iod.* (3x), *Baptis.* (1x), *Ferr. phos.* (3x)

Cough.—*Phos.* (3x), *Hyoscy.* (3x), *Bell.* (3x), *Bry.* (3x), *Hepar sulph.* (3x), *Dros.* (2x), *Ipec.* (2x), *Corallium rub.* (2x), *Lobel.* (2x), *Stannum* (6x), *Kali carb.* (6x), *Antimon. tart.* (3x), *Sang.* (2x), *Sticta* (1x), *Rumex*, (2x).

Gastric Disorders.—Consult remedies for chronic gastric catarrh.

Night Sweats.—*Agaracin.* (2x), *Atropin* (2x), *China.* (2x), *Chin. ars.* (2x), *Iodine* (2x), *Phos. ac.* (1x), *Ars.* (3x), *Sambucus* (2x), *Pilocarpin* (2x), *Sulph. ac.* (2x), *Nit. ac.* (3x).

Diarrhea.—Consult remedies for chronic intestinal catarrh.

Hemoptysis.—Consult article on hemoptysis.

Chest Pains.—*Bryon.* (3x), *Arnica* (3x), *Sulphur. acid* (2x), *Acon.* (2x), *Kali carb.* (6x), *Cimicif.* (1x).

Hoarseness.—*Spongia* (3x), *Caustic.* (3x), *Phos.* (3x), *Kali Bichrom.* (3x), *Hepar sulph.* (3x), *Bell.* (3x), *Kali iod.* (2x), *Rumex* (2x), *Brom.* (2x), *Iod.* (2x).

Aconite (3x).—Useful to control the fever when there is present the characteristic hard and full pulse, with great anxiety and restlessness. Also for the chest pains—lancinating pains, with labored, anxious breathing. One of the best remedies for hemoptysis. Consult article on hemoptysis.

Agaricin (2x).—Invaluable for night sweats. It is best given in 1x tablets—two or three tablets in the course of the evening and early night.

Antimon. tart. (3x).—Loose, rattling, hollow cough, worse at night, with suffocation; rattling of mucus audible to the patients and friends; aggravated by lying down; cough followed by vomiting; free and copious expectoration; prostration; afternoon hectic.

Arsenicum (3x).—Great prostration, rapid emaciation and pronounced hectic; characteristic thirst. Often relieves the oppressed breathing in advanced cases. Gastric intestinal irritation. Dr. T. F. Allen especially recommends *Ars. iod.* in advanced cases with cavities, hectic fever, etc. Gatchell says the latter "is the most important remedy in incipient phthisis, especially when there is a rapid loss of weight."

Baptisia (2x).—Especially recommended for the fever of phthisis. Particularly useful in adynamic cases, with dusky red face; sordes on lips and tongue; tongue dry and brown; offensive diarrhea; great prostration. Gatchell says Baptisia is useful "as an intercurrent remedy late in the disease, when there is fever; morning chills, followed by fever and perspiration, anorexia." Especially useful in the fibroid or interstitial form with pleuritic complications.

Bryonia (3x).—Tearing dry cough, as if the head and chest would burst; stitching pains in the sides, catching the breath; symptoms aggravated by motion; sputum thin, blood-streaked and scanty; soreness under sternum.

Calcareo carb. (6x).—This is a tissue remedy, and invaluable as a constitutional or basic remedy, in tubercular conditions with pronounced malnutrition. Incipient phthisis in young girls of characteristic leucophlegmatic temperament, with too frequent and profuse menstruation; or for scrofulous children, or those with weak bones, slow or difficult dentition, sensitiveness to cold or damp; poor digestion and assimilation, "acid dyspepsia;" easily fatigued; epistaxis. Phthisis with dry, hacking cough, especially at night, with profuse yellow, purulent, salty or sweetish expectoration; hoarseness; dyspnea on

ascending, etc. *Calc. phos.* may be indicated when the patient fails to present the characteristic *Calcareo carbonica* individuality, fair, fat and flabby, but is thin, emaciated, and the skin is not so white, having more of a brown or yellow hue.

Calc. phos. (6x).—The patient is always very sensitive to damp, and worse at every damp change of weather. The emaciation is marked and very rapid; greenish purulent expectoration.

Calc. iod. (3x) is often the remedy where there is involvement of the lymph glands, especially in young subjects.

Chin. ars. (2x).—A most excellent remedy for the fever of phthisis, especially when pronouncedly remittent or intermittent in character, Dyspnea with anxiety. Attacks of suffocation begin in morning and last till noon, with blue lips, hands and nails. Great prostration.

Cinchona (2x).—Often valuable in phthisis, especially when resulting from loss of fluids; profuse and debilitating sweats at night or whenever patient falls asleep; hectic; prostration after hemoptysis, seminal emissions, over-lactation, leucorrhea, and diarrhea; weak voice; great debility and anemia.

Drosera rot. (2x).—Dr. Clapp recommends *Drosera* for the tubercular predisposition, and phthisis following whooping cough. This drug is said to cause tuberculosis in animals. Paroxysmal cough, somewhat resembling whooping cough; paroxysms of variable duration, about two or three hours apart; paroxysms frequently end with vomiting of mucus or food; cough worse at night and on lying down; profuse disagreeable expectoration at end of paroxysm.

Ferrum met. (3x).—Frequently a valuable remedy in hemoptysis occurring in phthisis, especially in young people who are in the incipient stage of phthisis florida, flying pains in the chest, patients flush easily and get epistaxis, dyspnea and palpitation; cough spasmodic from tickling in the larynx; thin, frothy expectoration streaked with bright red blood; later the expectoration may be purulent and greenish; dyspnea relieved by warmth; hectic; fullness at stomach; vomiting; amenorrhea or watery menses; cough dry at night, but with copious expectoration of mucus or pus in the morning. *Ferr. iod.* is often useful in the suppurative stage, especially in chlorotic patients. *Ferr. phos.* is often useful for the fever in early stages, but not after cavities form.

Ferr. ars. (2x).—Marked anemia; pale skin and lips; in females, amenorrhea.

Hepar sulph. (3x).—Loose cough, with profuse purulent expectoration, very sensitive to cold air, takes cold easily; sweats easily from least exertion; hoarseness; bubbling râles audible to patient and bystanders;

high temperature; acute phthisis or acute exacerbations of the chronic disease.

Iodine (2x). — Has a great reputation in phthisis, especially where emaciation is extreme, notwithstanding a good appetite; "scrofulous" habit; swollen glands; morning sweats; Goodno recommends iodine applied externally when there is a dry, harassing cough.

Kali carb. (6x). — Chronic pneumonia of apex, with tendency to tuberculosis, hacking cough; short breath; weakness of chest; stitching pains; sensitive to cold air; dropsical swelling under the eyebrows; scanty, tenacious expectoration, difficult to dislodge, slips back into pharynx; often invaluable in tuberculosis, with purulent expectoration; cough worse from 3 to 4 A. M.

Kreosotum (2x). — As has already been stated this drug has a great reputation in tuberculosis and is vaunted as a specific. The fetid character of the expectoration, and the extreme burning pains in the chest are its chief indications; spasmodic, loose cough; frequent blood spitting; afternoon fever and morning sweat; great weakness and prostration; rapid emaciation.

Phosphorus (3x). I agree with Dr. Clapp, who pronounces phosphorus as "the king of remedies for phthisis." He says he "has seen more recoveries under this than with any other single remedy. Not only serviceable when the disease seems to be threatening in one predisposed, but also when it is well advanced." At the same time, the advice of W. A. Dewey is timely — that we should not expect too much of phosphorus, the choice should be carefully made and the remedy not too often repeated. It is especially valuable in the stage of tubercular deposit, especially of miliary tubercles, attended with afternoon fever, flushed cheeks, dry, short cough, rapid respiration and progressive emaciation. Said to be especially useful in tuberculosis occurring in tall, slender persons, or in the young who are rapidly growing; great debility; frequent attacks of bronchitis; hoarseness and aphonia; dry, tormenting cough; blood-streaked expectoration; tightness across the chest; hectic fever; diarrhea, especially after meals; phthisis florida.

Pilocarpine (2x). — An excellent remedy for profuse night sweats in acute cases. I generally use the second decimal in tablets.

Sanguinaria (2x). — A valuable remedy when phthisis follows pneumonia; phthisis florida; hectic fever; circumscribed redness of cheeks; cough loose, but expectoration difficult; cough worse when lying down; dyspnea; hemoptysis.

Silicea (6x). — Suppurative stage, with effusive, purulent expectoration; great debility and emaciation; sensitive to cold air, takes cold

easily; sweats at night or on slight exercise; tuberculous children with malnutrition; large bellies; weak ankles, and much sweat about the head.

Stannum (6x).—Especially when larynx is involved. The chief characteristic is a profuse mucous or muco-purulent expectoration, and great weakness in the chest. Later the expectoration may be greenish in color and have a sweetish taste. Reading aloud or talking produces great exhaustion and shortness of breath. Profuse, debilitating sweats night and morning or on slight movement. "Corresponds especially to catarrhal cases which are engrafted upon a scrofulous habit." (Dewey.)

Sulphur (6x).—In patients presenting the well-known sulphur individuality and general sulphur symptoms too numerous to be detailed. Especially following pneumonia. Fibroid phthisis. A valuable intercurrent remedy in sluggish cases that do not respond well to remedies, or improve and then relapse. According to Dewey, "Sulphur is best adapted to the early stages of phthisis, when there is an increase of blood to the chest, beginning dullness over the apices of lungs on percussion and diminished chest motion. After tubercles have become deposited, sulphur is a dangerous remedy to use. Unless cautiously used, it may rouse and ignite the downward tuberculous spark and hasten the disease; this fact seems well established."

DISEASES OF THE PLEURA.

PLEURISY.

Synonym.—Pleuritis.

Definition.—An inflammation of a part or whole of one or both pleural membranes.

Varieties.—(1) Dry, fibrinous pleurisy (acute plastic); (2) Sero-fibrinous pleurisy; (3) Purulent pleurisy (Emphysema); (4) Chronic pleurisy. Pleurisy may also be either local or general, and acute, sub-acute or chronic. It may also be primary or secondary. Special forms are designated according to their etiology as tuberculous, cancerous or septic.

1. Dry, Fibrinous Pleurisy (Acute Plastic).

Pathology.—The pleura loses its normal luster and appears dry and congested. A fibrinous exudate takes place, coating the pleura with a layer of lymph of variable thickness. It may present a rough, shaggy appearance or may be thick and stratified. Under the microscope the exudate is seen to consist of fibrin, leukocytes, red blood cells, and serum, the latter being slight in amount and rapidly absorbed.

In mild cases the exudate becomes absorbed. In severe cases it becomes organized and causes thickening and more or less firm adhesions

Etiology.—Fibrinous pleurisy may be either primary or secondary. The primary form is of rare occurrence and is caused by exposure to wet and cold, though modern theories regard these as merely predisposing factors to bacterial infection. It may also result from mechanical injury. It is more common in men than in women, and during the period of active life, on account of greater exposure, and is more prevalent during the winter and spring months. According to Anders, "In almost all instances a careful search will disclose the existence of some diathesis (tuberculous, gouty, rheumatic) that may be properly regarded as the favoring cause." Pleurisy may also result from an extension of an inflammatory process in neighboring organs. When in the right side, it may have originated from hepatitis. It may arise from caries of the ribs, or of the vertebræ, from perforation of an esophageal cancer, from tubercular disease of the bronchial glands, from pericarditis, from peritonitis, or may follow erysipelas of the walls of the chest. It sometimes develops in the course of acute articular rheumatism, and is very commonly present in patients suffering with gout or with chronic Bright's disease, or alcoholism.

Symptoms.—In the secondary form the pleuritic pain, or stitches in the side, a dry cough and friction râles are usually the only symptoms not masked by those of the primary disease.

The primary form begins with a chill followed by a sharp lancinating pain (stitch) near the nipple or in the axilla, aggravated by coughing and breathing, associated with slight tenderness on pressure. The respirations are rapid and shallow, 30–35 per minute, a short, dry, hacking cough, moderate fever, compressible pulse, 90–120. The temperature is usually from 100° to 102° F., rarely exceeding 103° F. In mild cases a stitching pain in the side on deep breathing, sneezing or coughing may be the only symptom present, and the patient continues his usual avocation. Very rarely severe cases occur with violent symptoms and a high temperature. Such cases often prove fatal.

Physical Signs.—The only characteristic physical sign of dry pleurisy is the pleural friction sound heard on auscultation. This consists of a grating, crackling crepitation, audible at all times, but more intense at the end of inspiration. It differs from the more moist crepitation of bronchitis in that it sounds superficial, as if it were directly under the ear, whereas in bronchitis the sound is evidently deeper in. Mucoid râles may arise from the rubbing together of pleural surfaces covered with lymph, and is sometimes not to be distinguished

from bronchial râles. After exudation takes place the vesicular murmur is feeble, vocal resonance is diminished or absent over the site of the exudate, percussion yields a variable degree of dullness, and the friction sounds are distinct during both inspiration and expiration, being intensified by deep breathing.

"The absence of pleuritic râles does not necessarily exclude pleurisy, as the râles may come and go, may only appear on deep breathing, and may, moreover, arise at areas which are deeply seated, as in diaphragmatic or mediastinal pleurisy." (Lockwood.)

Diagnosis.—Dry pleurisy can only be confounded with intercostal neuralgia or pleurodynia, but in these there is an entire absence of all the symptoms and physical signs of pleurisy save only the somewhat similar pain in the side, aggravated by breathing and coughing. Such cases sometimes pass for pleurisy, and are very commonly considered such by the laity.

Prognosis.—Most cases end favorably in from three to ten days, though exceptional cases may last for two or three weeks. Repeated attacks may leave a thickened and adherent pleura, which in rare cases interferes with normal expansion of the lungs and gradually develops interstitial pneumonia.

Treatment.—The patient should rest quietly in bed, and be allowed only a liquid diet. In some cases the symptoms are so mild that the patient will continue his usual pursuits and his ordinary diet, even though at some risk. For the pain, if severe, heat may be applied, either in the form of poultices, or still better the hot-water bag, or rubber coil. In some cases it may be better to strap the chest with adhesive plaster as for a fractured rib, in order to diminish the friction between the inflamed pleural surfaces.

The remedies most often required are *Aconite* (2x), *Bryonia* (2x), *Asclepias* (1x), *Kali carb.* (3x), *Ranunc. bulb.* (1x), *Rhus tox.* (3x) and *Sulphur* (6x.) For indications see Therapeutics of Pleurisy, page 355.

2. Sero-Fibrinous Pleurisy.

Pathology.—"Pleurisy with effusion" gives the same pathological features as dry pleurisy, though of a severer degree and covering a larger area, to which is added an excessive exudation of serum, the entire pleura becoming coated with a sero-fibrinous exudate, giving it a shaggy or a honey-combed appearance. The amount varies greatly in quantity, there being present usually from one to two pints or even more. The fluid is of a composition resembling that of blood-serum; its color is citron-yellow, and it may be clear, or somewhat turbid from flocculi of fibrin or from leukocytes and desquamated cells

from the pleural surface. Unless adhesions exist previously, the effusion gravitates to the most dependent portions of the pleural sac,—but rarely changes its level with a change in the position of the patient.

Mechanical Effects of the Effusion.—“The lung floats upward, its base resting on the fluid. As the fluid takes the place of the lung in the pleural vacuum, the lung is free to shrink, from its own elastic retraction, until the pleural sac is two thirds full of fluid; when this point is reached, the lung is in a condition of elastic equilibrium. Any excess of fluid over this amount exerts a direct pressure on the lung, so that in extensive effusions the lung is compressed, forming a dense, airless, carnified mass at the dome of the pleural cavity. The heart is bodily displaced to the opposite side, but it undergoes no twisting upon its axis, so that kinks in the great vessels do not occur. The diaphragm is sagged downward, and in right-sided pleurisy the liver is depressed. The intercostal spaces bulge, especially in children, and the affected side measures from one half to one inch more than the other side.” (Lockwood.)

Etiology.—The causes are the same as in dry pleurisy, the disease only assuming a severer form, usually owing to some previous condition of the patient. The disease may be primary, but is much more often secondary, it being claimed that three fourths of the cases are induced by tuberculous infection of the pleura, and that in one third of the cases pulmonary tuberculosis follows. Secondary pleurisy may occur during an attack of pneumonia, pericarditis, rheumatism, variola, scarlatina, measles, Bright's disease or puerperal fever.

Symptoms.—The onset may be abrupt, a moderately hard chill, followed by fever and a severe pain in the side marking the invasion, and in no wise differing from the initial symptoms of dry pleurisy. The disease reaches its maximum in about three or four days, then slowly subsides, reaching the normal in from six to ten days. In most cases the onset is gradual, the patient first complaining of a stitching pain in the side which is not very severe, but greatly aggravated on deep breathing, sneezing or any effort causing an action of the chest muscles. As effusion takes place, the pain is somewhat lessened, but the dyspnea becomes aggravated, and sometimes to an intense degree according to the amount of effusion. The patient heretofore lying upon the back, now lies upon the affected side, in order that the pressure of the fluid may not embarrass the action of the heart or of the sound lung, and at the same time the countenance wears an anxious expression. The cough, if any be present, becomes more distressing, and is usually accompanied by a scanty, mucous expectoration, but rarely blood-streaked. There is a moderate degree of fever, especially at night, and the pulse

is rapid and compressible. The temperature remains at about the same point during the attack, and does not remit or fluctuate as in emphysema, and there is no definite crisis. Should the temperature at any time rise as high as 104° F., or should it persist for more than three weeks, there is danger of tuberculosis or emphysema.

Physical Signs.—Before the effusion, the physical signs are precisely the same as in dry pleurisy. During the stage of effusion there are no physical signs until the exudation reaches ten or twelve ounces in adults, or three or four ounces in children.

Inspection shows enlargement or bulging of the affected side, with obliteration of the intercostal spaces and displacement of the cardiac impulse. On the affected side no movement takes place in respiration, while the healthy side is abnormally active.

Palpation.—The vocal fremitus is feeble or altogether absent. Above the site of the fluid, and on the sound side, the vocal fremitus is exaggerated. When the effusion is large, on palpation there may be fluctuation detected in thin subjects; by tapping one side smartly a wave traverses the liquid, and is felt on the opposite side.

Mensuration.—The difference in expansion between the two sides is readily determined. In using the cyrtometer the fact must be borne in mind that the right side is naturally larger than the left anyway. In large effusions there may be a difference of from one half to one or one and one-half inches at the end of expiration, though there is only a slight difference at the end of inspiration.

Percussion.—At first there is a slight impairment of the percussion note and, later, dullness growing steadily more pronounced as the effusion increases. The dullness is absolute over the site of the effusion, but is less marked above the effusion. As a rule, the dullness changes with the position of the patient. It is noticed higher anteriorly when the patient is sitting up, and when lying down it is much higher posteriorly. In large effusions, when the patient is sitting erect, the dullness is highest at the spine and falls, reaching its lowest point at the front. On the other hand, in moderate effusions, according to Ellis, the upper line of dullness begins “relatively low down in the back, passes upward from the vertebral column, and soon turns upward and proceeds obliquely across the back to the axillary region, where it reaches its highest point; thence it advances in a straight line, but with a slight descent, to the sternum.” This curved line resembles the italic letter S. (Garland.) If the pleural sac be filled, or the effusion confined by adhesions, these conditions do not obtain. In some instances the note above the level of the fluid is tympanitic or vesiculo-tympanitic. It is most marked under the

clavicle, constituting what is known as "Skoda's resonance." In copious exudations, especially in children, the note under the clavicle may be a "cracked-pot" sound, which may also be heard near to the spine on the affected side.

Auscultation.—The vesicular murmur is feeble, becoming more so as the exudation increases, and finally ceasing altogether over the side of the effusion, but is still heard above the line of effusion and of dullness. When the lung is compressed, but the bronchi are still permeable, and the body of fluid not too great, the breathing has the bronchial character, and has no vesicular quality. When the lung is flattened against the spine, no breathing sounds of any kind remain. Similarly *bronchial voice*, or *bronchophony*, is audible from the still pervious bronchial tubes, as is the bronchial breathing, but this ceases as the corresponding breath sound does, and no voice sound remains. *Egophony*, or goat's voice, is heard at the upper margin of the fluid in very exceptional cases by having the patient pronounce the words "want" or "plant." With the absorption of the fluid, the above physical sounds gradually disappear, and the pleural friction râle usually reappears. Besides the latter there are often heard, after the disappearance of the liquid effusion, coarse, creaking, grating sounds, which are produced by thickening of the pleura, and the rubbing together of the large masses of solid exudation yet remaining for absorption. These sometimes persist for months. There are also rather coarse, submucous or subcrepitant râles heard during the process of absorption, due to the opening up of tubes long compressed.

Diagnosis.—In the diagnosis of pleurisy, it is necessary to depend very largely upon the physical signs. The most important difficulties are experienced in the differentiation of pleurisy with effusion from conditions in which the lung is solidified or is displaced by tumors, cysts, etc. Of the former, lobar pneumonia is most important. The most important distinctions between it and pleurisy are tabulated by Anders, as follows :—

Pleurisy with Effusion.

Primary Lobar Pneumonia.

RATIONAL SYMPTOMS.

Onset marked by chilliness, persisting for a few days.

The pain is sharp, "stitch-like," and strictly localized.

Cough frequent and irritating; no expectoration.

A severe rigor, lasting about one hour.

Acute pain, similar, but soreness more diffused.

Cough accompanied by rusty or bloody expectoration.

Moderate fever, of continuous type; decline by lysis.

Systemic prostration, of medium severity.

Countenance pale and anxious.

Herpes does not appear.

Intense fever; decline by crisis from the fifth to the ninth day.

Prostration marked.

Countenance congested; mahogany flush on the cheeks.

Herpes quite common.

PHYSICAL SIGNS.

Inspection.

Marked distention of the thorax.

None.

Palpation.

Diminished or absent tactile fremitus.

Marked tactile fremitus (absent only when a bronchus is plugged).

Percussion.

Flatness, with great resistance to the pleximeter finger.

Dullness less complete, less resistance, and sometimes a tympanitic note.

Shows displacement of neighboring organs.

No displacement of neighboring organs, if uncomplicated.

If the sac be partly filled, there is a change in the line of flatness on change of position.

Absent.

Auscultation.

Diminished or absent breath sounds; bronchial breathing frequent, but diffused and distant and unaccompanied by râles, as a rule.

Harsh bronchial breathing and presence of râles in first and third stages, unless a bronchus be plugged.

Vocal resonance diminished or absent.

Bronchophony, unless a bronchus be blocked.

Friction sound in early and late stages.

No friction sound, except crepitant râles in the first stage.

Aspiration.

Yields serum.

Yields a few drops of thick blood.

An abscess of the liver pushing up the diaphragm, or an echinococcus cyst growing in the same direction, of sufficient size to displace the lung in the same way, will cause the physical signs of an effusion into the thorax, and the diagnosis is possible only by a careful study of the history, which is entirely different in the two affections. Echinococcus cysts of the liver must be differentiated in much the same manner. A tumor or cyst of the chest will produce dullness on percussion, displace organs, and, by compressing the lungs, cause the disappearance of the voice and breath sounds. In these cases the history of the case, the dullness toward or about the central and upper parts of the chest in tumor, the circumscribed and irregular bulging caused by tumor, and exaggeration of the vocal fremitus will serve to distinguish these affections from pleurisy with effusion.

In all cases where the diagnosis is in doubt, the aspirating needle should be used with strict antiseptic precautions. This not only shows the presence of fluid, but also determines its character — whether serous, hemorrhagic or purulent.

Prognosis.— The immediate prognosis of simple sero-fibrinous pleurisy is good, though in rare instances death results suddenly from apparently unexplainable causes. The ultimate prognosis depends entirely upon the primary cause of the attack, the underlying constitutional conditions, and the sequelæ that may arise — from the development of emphysema or from thickening of the pleura, and from adhesions. The prognosis of double pleurisy is usually unfavorable. The duration is exceedingly variable, some cases running a very rapid course, and others a very gradual one.

Treatment.— During the inflammatory stage, the patient should be kept in bed and allowed only a liquid diet. Heat may be applied either in the form of hot fomentations, poultices, or the rubber coil. For the purpose of hindering respiratory movements, strips of adhesive plaster may be firmly and evenly applied. These should be about three inches wide and sufficiently long to completely encircle the affected side. It is also claimed that this treatment will greatly limit the amount of effusion. *Aconite* at the onset, or *Bryonia* soon after, are the remedies required in a large majority of cases. Also consult *Therapeutics of Pleurisy* at the end of this article.

After the stage of effusion is established, the main object of treatment is to get rid of the accumulation. In large effusions, aspiration is necessary in most cases. In simple sero-fibrinous pleurisy, especially in children, and where the quantity of effusion is small, homœopathic remedies exert a remarkable influence in bringing about absorption. Anders gives the following indications for aspiration:—

“1. During the febrile stage, while efforts are being directed to combating the inflammatory process. The object during this stage is to avert imminent danger to life, and not merely to remove the fluid. The conditions demanding immediate thoracentesis are : (a) when one pleural sac is completely filled or when Skoda's resonance extends from the clavicle downward no farther than the second interspace; (b) in double pleurisies, when both sides are half filled, since death may occur from rapid filling of one or the other side; (c) in cases of copious effusions, upon the first signs of involvement of the unaffected side, such as moist râles, broncho-vesicular breathing, and impaired resonance; (d) the appearance of serious symptoms, such as orthopnea or syncopal attacks with cyanosis; (e) marked displacement of the heart, especially if one or more murmurs develop in the organ,

"2. The indications for aspiration during the second or afebrile period, when the main object is to remove the exudate, are: (a) if no diminution in the quantity of liquid effusion takes place one week after the temperature has reached the normal; (b) in subacute cases, in which there is little, if any, temperature from the beginning; aspiration should not then be withheld longer than three weeks."

If the operation is carefully conducted under antiseptic precautions, it is practically free from danger. The patient should be placed in a semirecumbent position, the hand being placed upon the shoulder of the opposite side. The instrument having been previously tested, the needle is inserted below the level of the fluid, usually in the eighth space in the axillary line and at the upper border of the ribs. The fluid should be withdrawn slowly, not more than fifty ounces being withdrawn at one time, the operation being immediately stopped if severe pain, dyspnea, faintness or incessant cough develop. Proper stimulants should be at hand in case they are required. The operation may be repeated at intervals of several days if necessary, but usually after the first aspiration absorption of the remaining effusion takes place. The operation, is contraindicated in very old or feeble persons, and in cases complicated with lobar pneumonia.

The strength of the patient should be sustained by a nutritious diet. When possible, systematic gentle exercise in the open air is to be encouraged, and deep inspirations should be practiced at regular intervals in order to bring about chest expansion. During the stage of effusion the remedies most often required are *Apis* (3x), *Arsen.* (3x), *Arsen. iod.* (3x), *Canth.* (3x), *Kali iod.* (2x) *Squilla* (1x), *Sulphur* (6x). Consult also Therapeutics of Pleurisy, page 355.

3. Purulent Pleurisy (*Empyema. Pyo-thorax*).

Definition.—A suppurative inflammation of the pleura.

Pathology.—In empyema the primary changes are the same as in sero-fibrinous pleurisy, the exudation being sero-fibrinous and becoming purulent later on, usually not until after the first week. It may be sero-pus, or thick and creamy, or of a greenish or yellowish color. The odor may be sweetish, or, especially after wounds, foul and gangrenous. Microscopic examination gives the characteristics present in other purulent exudations. The reaction is acid, whereas serous fluid is alkaline. There is always great thickening of the pleural membrane, the surface presenting a granular suppurating surface, constituting a pyogenic membrane. Perforations are often present, and on the costal pleura erosions are quite frequent. Sacculations are more common than in sero-fibrinous pleurisy, and the lung is more apt to be greatly compressed.

Etiology.—Empyema may occur as a sequel of acute sero-fibrinous pleurisy, though undoubtedly some cases of the latter, especially in children, are purulent from the first, the source of infection being unknown. In some instances empyema results from aspirating the serous effusion, though Osler considers this a rare occurrence. Empyema may occur secondarily in acute infectious diseases, especially scarlet fever, and may follow pneumonia or malignant diseases of the lungs or esophagus. It may result from gangrene, abscess, or septic emboli of the lung, or ruptured tubercular cavities, or from abscess of the liver, or peritonitis perforating the diaphragm. It may follow penetrating wounds of the chest or fracture of the ribs.

Symptoms.—The onset may be sudden, or, more often, insidious, and the symptoms and course are practically the same as in sero-fibrinous pleurisy, to which are added, sooner or later, the symptoms of septic infection—erratic chills, high remittent temperature, cold sweats, prostration, diarrhea, emaciation, and the development of a septicemic or typhoid condition. Anders has found, “on more than one occasion,” an entire absence of pain, dyspnea, cough and expectoration. “If empyema follow pneumonia, there is usually an attempt at crisis. The temperature, however, rises again and becomes remittent, dyspnea develops, septic symptoms appear, and the physical signs of a pleural effusion make their appearance.”

The pus may rupture into a bronchus giving immediate relief, or, on the contrary, causing asphyxia, septic broncho-pneumonia or pneumothorax. Rupture may take place externally, resulting in a spontaneous cure or in a fistula being established. In the latter case, the drainage is usually poor and improvement only temporary. The pus may also perforate the esophagus, pericardium, stomach or peritoneum. Occasionally it “burrows along the spine behind the peritoneum and the psoas muscle, reaching, finally, the iliac fossa and simulating psoas or lumbar abscess.” (Anders.)

Physical Signs.—The physical signs are practically the same as those of sero-fibrinous pleurisy, though the intercostal spaces are usually obliterated to a greater extent, and there may even be a protrusion, and often there is some edema over the site of the effusion. This is most apt to occur in children, and in such cases there is a tendency for the pus to rupture externally, usually at the fifth interspace anteriorly, less often at the third or fourth, and sometimes below the angle of the scapula behind. If the purulent effusion is of considerable size in children, the respiratory sounds over it may be low and tubular, often causing a mistaken diagnosis of pneumonia to be made. Whispered speech is rarely transmitted through a purulent effusion. Pulsations synchronous

with the cardiac systole is designated as pulsating pleurisy, and, in rare instances, also occurs in the sero-fibrinous variety. The cause of this condition is not definitely known.

Diagnosis.—The diagnosis of a purulent effusion is only made positive by aspiration, an ordinary exploring needle usually answering the best purpose, as only a small quantity needs to be withdrawn for the purpose of examination. Pulsating pleurisy simulates thoracic aneurysm, but the location is not over the aorta, the symptoms and signs of pleurisy are present, while those of aneurysm are absent.

Prognosis.—Empyema is a very serious disease. In some cases, absorption takes place and the patient recovers; but in most instances, if the pus is not evacuated, death results. In some cases, death is due to sepsis, or the patient becomes hectic and dies from exhaustion, the result of a long-continued suppuration. The latter sometimes occurs after the evacuation has been secured, the discharge keeping up indefinitely. If rupture into the bronchus occurs without suffocation resulting, recovery usually takes place. The results of rupture elsewhere have already been considered. Often death results from the primary disease, or some associated affection. The prognosis is better in children than in adults, and is much more favorable in those cases where prompt surgical measures are adopted, as the pus can not be allowed to remain with impunity, though no doubt homœopathic remedies have great power in controlling the suppurative process.

Treatment.—The surgical treatment of empyema consists in incision and drainage, aspiration (thoracentesis) being rarely of service, except, perhaps, in mild cases and in pneumonic cases occurring in young children, and for the purpose of affording temporary relief, preparatory to more radical measures. Resection of a rib is a surgical measure sometimes required. In case the discharge is offensive or gangrenous, the cavity may be irrigated with a mild antiseptic solution, but otherwise irrigation is not permissible, chiefly on account of the danger of sudden collapse. According to Osler, "Even in the most desperate cases, the surgeon should never hesitate to make a free incision." The details for operative treatment are to be found in text-books on surgery. After operation, chest gymnastics should be adopted, for the purpose of favoring obliteration of the cavity. The method advised by Ralston James is most popular. It consists of forced expiratory efforts for the purpose of expanding the retracted lung, and is thus described by Osler: "The patient daily, for a certain length of time, increasing gradually with the increase of his strength, transfers by air pressure the water from one bottle to another. The bottles should be large, holding at least a gallon each, and by the arrangement of tubes, as in the Wolff's

bottle, an expiratory effort of the patient forces the water from one bottle into the other. In this way expansion of the compressed lung is systematically practiced. The abscess cavity is gradually closed, partly by the falling in of the chest wall, and partly by the expansion of the lung. In some instances, it is necessary to resect portions of one or more ribs."

When the suppuration continues for any length of time, whether or not evacuation is in progress, the strength of the patient must be supported by the administration of nutritious and easily digested foods, especially milk, beef-tea, bovine, etc.

The remedies most often required are *Arsen.* (3x), *Arsen. iod.* (2x), *Calcar. carb.* (30x), *Chin. ars.* (2x), *Hepar sulph.* (3x), *Iodine* (2x), *Lach.* (6), *Merc. sol.* (3x), *Phos.* (3x), *Silicea* (6x) and *Sulphur* (6x). For indications, see Therapeutics of Pleurisy, page 355.

CHRONIC PLEURISY.

Synonym.—Chronic Adhesive Pleurisy.

Definition.—Chronic inflammation of the pleura, either with or without effusion.

Chronic Pleurisy with Effusion.—This variety may develop insiduously, but is more apt to follow an attack of acute sero-fibrinous pleurisy. Sometimes the exudate persists for a long time, the morbid lesions, including the character of the exudate, in no wise differing from those already described under sero-fibrinous pleurisy, save that the fibrin usually predominates over the serum in the composition of the exudate. The symptoms and physical signs vary but little from those of sero-fibrinous pleurisy. Often a slight dyspnea on exercising is the only symptom manifest. If the exudate becomes purulent, the hectic and other characteristics of the latter are present, a fatal termination being not unusual. Purulent changes are quite likely to occur early in children. The patient loses flesh and strength, becomes anemic, and often has a harassing cough, due to bronchial irritation. The disease lasts from a few months to several years unless cut short by an intercurrent phthisis, or some other intercurrent disease. When recovery takes place either from absorption or removal of the exudate, there remains a decided contraction, especially after empyema, owing to the fact that the lung is covered by thick organized bands of adhesion which prevent full expansion.

Chronic Dry or Adhesive Pleurisy.—This may follow an ordinary sero-fibrinous pleurisy, but is most often a sequel of empyema, and is a common lesion in chronic pulmonary phthisis. The pleural surfaces are more or less adherent, being separated only by a fibrinous

material which becomes converted into a layer of firm connective tissue. The process goes on, chiefly at the base, the lung becoming compressed and the seat of fibroid change. In cases following chronic pleurisy and especially empyema, the retraction and flattening is quite marked, and calcification is not unusual, while pockets of fluid are sometimes found between the false membranes. The symptoms are indefinite or entirely absent, such patients often remaining in comparatively good health for many years. There is a form of dry pleurisy described by Osler as primitive dry pleurisy, which is dry from the start. It may follow acute plastic pleurisy or occur as a primary affection without any acute symptoms preceding. In all cases adhesion of the pleural layers takes place, as is shown by numerous autopsies in those who during life have never had symptoms of pleurisy. If the condition is general on both sides, there may be an impairment of respiratory movements, but more often there is no disturbance whatever.

"Definite rational symptoms are rarely present, and the physical signs lack uniformity or may be entirely negative. In other cases of a mild grade the main characteristics are restrained mobility of the affected side and feebleness of the respiratory murmur. In rarer cases the feebleness of the breath sounds is out of all proportion to the expansive motion of the chest. In still another category, composed of a considerable number of instances, certain physical signs are quite pronounced. Inspection reveals decided contraction, with immobility of the affected side and a compensatory distention of the healthy side. The heart is displaced, and the apex beat may be missing. The spinal column is curved, the scapula is dislocated, the shoulder ill-shapen and drooping, and the lower part of the thorax shrunken, while the ribs are obliquely placed and closely approximated, or even overlap one another. The tactile fremitus is decreased or absent over the lower portion of the chest, and there is impaired percussion resonance or dullness over the same area. The breath sounds on auscultation are exceedingly feeble, and in some instances an occasional dry, leathery, or creaking friction sound is audible." (Anders.)

Osler describes a primitive dry pleurisy of tuberculous origin: "Both parietal and costal layers are greatly thickened, perhaps from two to three millimeters each, and present firm fibroid caseous masses and small tubercles, while uniting these two greatly thickened layers is a reddish-gray fibroid tissue, sometimes infiltrated with serum. This may be a local process confined to one pleura, or it may be in both." These cases are frequently combined with a similar condition of the pericardium and the peritoneum.

Treatment.—The treatment consists chiefly in improving the nutrition of the patient by proper dietetic and hygienic measures, and in methodical gymnastics of the lung for the purpose of increasing chest expansion, the details of which have been previously considered. Where effusion is present, its removal in small quantities at a time may be indicated. A change of climate is often beneficial, especially where there exists a tendency to tuberculosis. As a rule, low mountainous altitudes, combined with purity of atmosphere, give the best results. The digestive power of the patient should be promoted as far as possible, and all constitutional conditions and symptoms should receive careful attention.

Silicea (6x) and *Sulphur* (6x to 30x) are the remedies oftenest required.

Therapeutics of Pleurisy.

Aconite (2x).—This remedy is nearly always indicated in the initial stage of acute cases. Chills; fever; great thirst; quick pulse; dry skin; anxious restlessness; agonizing tossing about; stitching pain in chest; inability to lie on the right side; dry, hacking cough.

Arnica (3x).—After mechanical injuries; bruised feeling in chest; expectoration of bloody foam; nervous persons; body cool, head hot. Raue says Arnica is followed well by *Sulph. ac.* in traumatic cases.

Asenicum (3x) is to be given when there are great prostration and threatening collapse. The effusion is copious and rapid. It is well indicated for those patients who are weak and cachectic, malarial, or who are addicted to alcohol. An excellent remedy in empyema. *Ars. iod.* is often a more satisfactory remedy, especially in tubercular subjects.

Apis (3x).—This drug is often of great value in the stages of effusion. Indicated when there is great dyspnea; the patient is unable to lie down, and feels as though he could not draw another breath. The urine is dark and scanty. No thirst. Jousset has employed it with excellent effect when Cantharides failed to produce absorption.

Asclepias tub. (2x).—Hale says of this drug: "It seems to be a lesser Bryonia, and is probably not adapted to severe cases. The fever is not as high and the effusion is probably serous. The symptoms are: Acute pleuritic pain in right side, with dry, hacking cough and scanty mucous expectoration, better by bending forward and worse by motion; also stitches to the right side, and up to the left shoulder; severe pain in the muscles and joints, hot, sweating skin with amelioration of the pain."

Bryonia (2x).—Bryonia usually follows Aconite after the extreme high fever and restlessness have been subdued and effusion is about to occur, the symptoms being less violent. It is often the first remedy to prescribe where the onset is not violent, and effusion occurs early. Crawford says, "It is especially useful in the secondary form of pleurisy of the plastic variety, and circumscribed in extent." In all cases, the chief indication for Bry. is the stitching pains worse from motion, and especially on deep inspiration, relieved by lying on the affected side. The most common remedy for the "dry" pleurisies so frequently associated with pneumonia and phthisis.

Cantharis (3x).—The virtues of Cantharis in the sero-fibrinous variety are highly extolled by Jousset. Goodno says, "Cantharis is much more efficient than Bryonia in sero-fibrinous exudations, and it is my custom to administer it as soon as the nature of the case is clear, unless there are good reasons for selecting another medicine. The dose seems important. Tincture of Cantharides, ten drops in four fluid ounces of water, given in teaspoonful doses every one to three hours, is an efficient method of administration." Jousset used the 3d dil. usually, but if the condition did not respond promptly, he descended as low as the tincture, if necessary.

The indications are: Profuse serous exudation; frequent cough; dyspnea; palpitation; profuse sweats; great weakness; tendency to syncope; scanty and albuminous urine.

Digitalis (1x).—Sero-fibrinous effusion with great dyspnea and a weak heart. Wurmb, Fleischmann and Baehr all recommend this remedy for pleurisy with abundant serous effusion.

Hepar sulph. (3x).—Especially useful in empyema, with intermittent paroxysms of hectic fever. Given in a high potency, it will often prove beneficial. If given low, it will usually aggravate the suppurative process. Often useful in a persistent plastic pleurisy when its characteristic symptoms are present.

Kali carb. (6x).—Especially indicated in dry pleurisy, particularly when complicating phthisis, also when the stitching pains do not yield to Bryonia. Dry cough, worse about 3 or 4 A. M.

Kali. iod. (2x).—Later stages, occurring in mercurial, syphilitic or gouty patients. A greenish expectoration is especially characteristic.

Merc. sol. (3x).—Empyema, particularly in children, when the exudate becomes purulent at an early stage. Also in syphilitic and rheumatic subjects, chronic pleurisy. Patient chilly when moving. Copious sweats affording no relief. Hepatic, intestinal or gastric complications with characteristic symptoms.

Phosphorus (3x).—Often of value when there is a complication

with lobar pneumonia or bronchitis. Tightness across the chest; dry, tight cough, which is worse from evening until midnight. Later stages; purulent infiltration; hypertrophy of the right heart; Bright's disease.

Rhus tox. (3x). — Attacks brought on from exposure to wet, or from straining or lifting, with muscular pains and great restlessness. Typhoid symptoms.

Senega (2x) should be given in subacute or chronic pleuritis, when complicated with heart disease or phthisis, and when there is a marked tendency to anasarca. (Crawford.)

Hale says, "No obstinate case of pleurisy should be treated without referring to Senega."

Squilla (2x). — "Squilla is undoubtedly a valuable remedy in pleurisy. It resembles Cantharis as well as Bryonia, having many symptoms in common with both. It is rarely mentioned among the remedies for pleurisy, and when it is mentioned, the indications are poorly given. I have more confidence in it than I have in Cantharis, especially in children whose pleurisies are rapid and dangerous. I consider it useful when the pleuritic affection is attended with capillary bronchitis, caused by exposure to cold or dampness after eruptive fevers. The effusion is serous and forms rapidly, while the kidneys are very torpid and the heart rapidly failing in force." (Hale.)

Silicea (6x). — An invaluable remedy in chronic empyema. It will do more than any other drug to check the suppurative process.

Sulphur (6x). — Chronic pleurisy with slow absorption of exudate. According to Raue it follows well after Bryonia or Rhus tox. Especially useful in patients presenting the Sulphur individuality — eruptions on the skin, bright red lips, etc.

Tartar emet. (3x). — Kafka recommended this drug as a specific in pleuro-pneumonia at the onset. It is no doubt of great value when there is great dyspnea, rattling in the chest and cyanosis.

PNEUMOTHORAX.

Definition. — A collection of air in the pleural cavity. Air alone is rarely present, being usually associated with either serum or pus, in which case it is known respectively as hydro-pneumothorax and pyo-pneumothorax, the latter being the more common.

Pathology. — "When air enters, the pleural vacuum is at once destroyed, and the lung shrinks by reason of its own elasticity, the heart is displaced bodily toward the opposite side, and the liver sags downward, exceeding the downward displacement observed in pleural effusion. If the point of perforation remain open, the intrapleural air is at atmospheric pressure, and the lung is not compressed. If the

orifice of rupture be valve-like (ventilating pneumothorax), air can enter during inspiration, but its exit during expiration is prevented, so that the intrapleural pressure becomes raised and the lung becomes compressed and carnified. The point of rupture may be large, constituting a pleuro-bronchial fistula, especially in long-continued cases, or it may be small, baffling detection on post-mortem examination.

"The effusion sinks to the dependent portion of the pleural cavity; its upper level is a straight horizontal line (there being no Garland's S-curve, as with pleurisy with effusion), and the level of the fluid changes regularly with the varying position of the patient. In rare instances the orifices of perforation are surrounded by pleural adhesions, so that a localized sacculated pyo-pneumothorax results." (Lockwood.)

Etiology. — Pneumothorax occurs chiefly in adults, and in males more than females. Rarely is it found in young children. The left side is affected twice as often as the right. The most common exciting cause of pneumothorax is perforation of the lung. In a majority of cases this is due to the rupture of a phthisical cavity. According to S. West, ninety per cent of all cases are due to this cause. In rare cases the air vesicles may rupture from violent straining as in severe fits of coughing, especially in whooping cough. In still rarer cases rupture of the lung may be due to septic broncho-pneumonia, gangrene, cancer or the breaking of a hemorrhagic infarct in chronic heart disease. Pneumothorax may also result from perforation from the pleura into the lung in connection with empyema and abscesses of the chest walls. Perforation wounds of the chest are not an uncommon cause. Cases have resulted from the use of an exploring needle. Fracture of the ribs may cause pneumothorax, although this is very rare. Perforation of the pleura and resulting pneumothorax may occur from the rupture into the pleura of an abscess or cancer of the colon, stomach or esophagus.

Symptoms. — As a rule, the onset is sudden and alarming. The patient first complains of an agonizing pain in the side, and a sensation as if "something had given way." The dyspnea is at once urgent, cyanotic symptoms develop rapidly, and collapse is imminent, the patient showing marked lividity, prostration, cold, clammy surface and a rapid, feeble pulse. Death may result within a few hours, but more often the symptoms of collapse disappear, the pain continuing and the respiration remaining rapid and insufficient. The lividity continues, the patient sits with the body inclined to the affected side, and symptoms of dropsy or venous congestion become manifest. Hectic fever follows the subnormal temperature of collapse, and symptoms of pleural effusion are subadded. Death finally results from exhaustion or

sepsis. In some instances no urgent symptoms are manifest, the disease running a latent and obscure course. This is especially the case when pneumothorax develops during the last stages of phthisis.

Physical Signs. — *Inspection* shows enlargement and immobility of the affected side, the intercostal spaces being widened and effaced or even bulged out so that the surface of the chest is smooth. *Palpation* shows a diminution or entire absence of the vocal fremitus and a displacement of the heart. The *percussion* note over the area containing air is hyperresonant, or even tympanitic or amphoric in quality. If the amount of air in the pleural cavity becomes extreme, there is dullness on percussion, associated with a feeling of great resistance or density. If the air in the pleural cavity freely communicates with the external air, the "cracked-pot" sound is heard. When effusion of blood and pus occurs, dullness is observed over the lower part of the chest, hyperresonant or tympanitic percussion note over the upper portions of the chest, these sounds changing as the patient changes position. "Movable dullness can be obtained much more readily in pneumothorax than in a simple pleurisy." (Osler.)

Auscultation shows a diminution or entire absence of the respiratory murmur, or there may be a distant inspiratory murmur of amphoric quality. When the orifice of rupture admits air freely, voice and breathing may be typically amphoric, usually associated with a metallic echo. Metallic tinkling, or the bell sound, is sometimes distinctly produced by breathing, coughing or speaking. This sound is frequently caused by drops of fluid falling from above the surface of the effusion. Vocal resonance may be entirely absent, but is usually feeble and possesses the metallic quality. The Hippocratic succussion consists of loud splashing sounds heard when the patient is violently shaken. The "penny-click" of Trousseau is considered by some a pathognomonic sign. It is obtained by pressing a coin firmly in an intercostal space in front and tapping it with another coin while the auscultator listens at the back of the chest. There is transmitted an intensified echoing of the metallic sound thus produced, indicating the presence of an air cavity.

Diagnosis. — With the above signs together with more or less heart and liver displacement the diagnosis should be easily established. The sudden urgent symptoms at the onset, together with the coin sound and succussion splash, which belong to no other disease, ought to easily differentiate pneumothorax from a large phthisical cavity, with which condition it is most often confounded. Diaphragmatic hernia following a severe injury and subhrenal pyo-pneumothorax

offer many symptoms in common with pneumothorax, but present an entirely different history, and lack the characteristics above mentioned.

Prognosis.—In rare cases the fistulous opening becomes closed by inflammatory action, and recovery takes place. Cases following empyema occasionally recover. As a rule, the prognosis is unfavorable, depending entirely upon the nature of the pre-existing disease, the amount of infection of the pleura and the severity of the shock and reaction. Osler says, "Pneumothorax developing in a healthy individual often ends in recovery. There are cases of phthisis in which the pneumothorax, if occurring early, seems to arrest the progress of the tuberculosis."

Treatment.—The first thing to be done in cases of sudden onset, and that without delay, is to administer a hypodermic injection of morphine to relieve the agonizing pain. Here our ordinary remedies are of no service, as the cause is purely mechanical. Hot applications may also be applied with some benefit. The symptoms of shock must be treated on general principles, stimulants and heat being chiefly required. The further treatment of the disease is practically the same as that for sero-fibrinous pleurisy to which the reader is referred.

HYDROTHORAX.

Synonym.—Dropsy of the Pleura.

Definition.—A collection of simple, non-inflammatory serum in the pleural cavities.

Pathology.—Hydrothorax is usually bilateral, though in cases following cardiac disease there may be but one side involved. A more or less clear amber-colored, non-fibrinous fluid is present causing similar mechanical effects as those produced in sero-fibrinous pleurisy. There are no signs of inflammation, the pleural surfaces remain normal and the amount of effusion is rarely excessive.

Etiology.—Hydrothorax is always a secondary process, occurring in connection with dropsy of other organs, with profound anemia, with renal or cardiac disease, and may result from pressure of a tumor upon an intrathoracic vein, in which case only one side is involved.

Symptoms.—The symptoms are only those that result from mechanical pressure upon the lungs—dyspnea and cyanosis. Even these are often rendered obscure by the symptoms of the primary disease.

Physical Signs.—These are practically the same as in sero-fibrinous pleurisy. No friction râles are heard, and, as inflammatory

adhesions are not present, the fluid more readily changes its level with a change of position of the patient.

Diagnosis.—Hydrothorax may easily be distinguished from pleurisy with effusion, by the presence of a history of renal, cardiac or hemic disease, by the entire absence of fever, pain and other inflammatory symptoms, and by the absence of pleural râles.

The *prognosis* depends entirely upon the nature of the primary disease.

Treatment.—The treatment is usually that demanded by the symptoms of the primary disease. The remedies most often required are *Apis* (3x), *Apocynum* (Tr.), *Arsen.* (3x), *Arsen. iod.* (3x), *Digitalis* (1x) and *Sulphur* (6x). As a rule aspiration is not best, but in cases producing mechanical compression, interfering with the functions of the heart and lungs, it should not be too long delayed, and should be repeated when the symptoms again arise demanding it.

SECTION III.

DISEASES OF THE CIRCULATORY SYSTEM.

METHODS OF DIAGNOSIS.

IN no other class of diseases is it more necessary that the diagnostician possess a thorough knowledge of the physical signs of abnormality and a keen perception of their presence, as the diagnosis of cardiac diseases is often attended with the utmost difficulty, and their differentiation from each other frequently depends upon the exercise of the most delicate powers of observation guided by careful study and experience. In an examination of the heart it is necessary to carefully and systematically employ (1) Inspection; (2) Palpation; (3) Percussion; (4) Auscultation.

(1) **Inspection.**—This reveals any abnormal departure in the symmetry of the two sides of the chest, which might result from a deformity of the chest walls, causing a displacement of the heart, or, might occur from partial fixation due to pleural adhesions or fibroid disease of the lungs. It also reveals any possible retraction of the intercostal spaces, which, if occurring during the heart's systole, indicates pericardial adhesions or hypertrophy with dilatation.

Inspection also, and which is usually more important, reveals the exact point of apex beat and the presence or absence of any abnormal pulsations. The apex beat is normally visible in the fifth intercostal space halfway between the left nipple and the left border of the sternum. It is only seen distinctly in those with thin thoracic walls, and is barely seen in those who are very fleshy. It moves to the right or left if the individual lies on either side, and may be displaced downward by inspiration and elevated by expiration.

As a result of disease the impulse may be displaced: to the right

by left pleuritic effusions; to the right or left when the corresponding lung is retracted; downward by cardiac hypertrophy or pulmonary emphysema; upward by pericardial effusion, to the left by hypertrophy of the left ventricle.

(2) **Palpation.** — This verifies the observations made by inspection, and also determines the force of the cardiac beats, as well as their frequency and regularity, and reveals any friction rubs or any abnormal thrills in the pulsations.

The force of the cardiac impulse is increased by hypertrophy of the heart, but it is also increased during sthenic fevers, in the first stage of endocarditis, and in functional heart disturbances. The force of the cardiac impulse is decreased in cardiac dilatation, in degenerations of the heart, in emphysema, in pericardial effusions, and in asthenic diseases.

(3) **Percussion.** — By percussion we determine the size of the heart, and its relation to surrounding structures. The boundaries of the heart vary somewhat in health, but for all practical purposes it may be said that the superior boundary is at the upper edge of the third rib; the lower boundary at the fifth intercostal space, the left lateral boundary at, or a little within, the mammillary line; the right lateral boundary about one half an inch to the right of the sternum.

The superficial cardiac space, over which there is an area of flatness or absolute dullness, represents that portion of the heart not covered by the lungs. It is triangular in shape, the apex being at the junction of the lower border of the left third rib and the sternum, its right border at or about the middle of the sternum, its left border extending from its apex outward and downward in a curved form to the fifth intercostal space. Its area does not exceed two inches in either direction and varies a little during inspiration and expiration. It is increased by cardiac hypertrophy; dilatation or pericardial effusion, and is diminished by emphysema, by pleural effusions and by pneumothorax.

The deep cardiac space, over which there is only a relative cardiac dullness, represents that portion of the heart covered by lung tissue. This begins at the upper border of the third rib and extends to the lower border of the fifth intercostal space, and from half an inch to the right of the sternum to near the left nipple. Its area is increased by hypertrophy, by dilatation, by pericardial effusion, and by left pleuritic effusion.

(4) **Auscultation.** — By auscultation we ascertain the character, location and intensity of the normal sounds of the heart, and are thus capable of determining their deviation from normal, which constitutes the most essential feature in the diagnosis of cardiac disease.

The heart gives two sounds, known as the first and second sounds. Between the two there is a short pause, and between the second sound and the first sound there is a long pause. The first sound is called the systole and is caused by the closing of the tricuspid and mitral valves due to the contraction of the ventricles and the simultaneous dilatation of the auricles. This sound is of long duration, is low-pitched, and has a booming quality. The point of greatest intensity of the first sound is at or near the apex. It is practically synchronous with the apex beat and the carotid and radial pulse. The sounds of the mitral valve are best heard at the apex of the heart, while those of the tricuspid valves are best isolated at the ensiform cartilage or a little to the left. The second sound is called the diastole, and is caused by the closing of the aortic and pulmonary (semilunar) valves, due to the dilatation of the ventricles and simultaneous contraction of the auricles. It is of shorter duration and higher pitched (clicking) than the first sound. Its point of greatest intensity is at the second right costal cartilage, which corresponds to the aortic valve. The sound of the pulmonary valves are best heard at the third left costal cartilage.

The sounds of the heart may become changed in their location, intensity and character, or they may be associated with other sounds known as cardiac murmurs. The intensity of the cardiac sounds are increased by hypertrophy, irritability of the heart, consolidation of adjacent lung tissue and in febrile conditions, and are diminished in dilatation, cardiac degeneration, asthenic fevers and general enfeebled conditions of the system. The pitch of the first sound is increased when the ventricular walls are thin, in fibroid changes and in low fevers, the valves being in normal condition. A single sound being thus increased, it is called accentuated, and is usually due to the closure of the valves under an increased blood pressure. If the valves do not receive simultaneously the increased tension thus caused, the sound is reduplicated. This reduplication is not characteristic of any special lesion, and may only be temporary. The second sound is more often reduplicated than the first sound.

The second sound is duller and of lower pitch than normal when there is thickening of the aortic valves, or when the aorta has become to any extent inelastic.

Either or both sounds may have a metallic ring. This is heard at the apex in the first sound when there is increased cardiac activity, even though the heart be normal, though it usually indicates cardiac hypertrophy. A metallic ring with the second aortic sound usually indicates atheroma. A metallic ring of either or both sounds may be present

with an irritable heart, during gaseous distention of the stomach, with a large lung cavity near the heart, in pneumopericardium and in pneumothorax.

The location of the cardiac sounds may be changed by a displacement of the heart caused by chest effusion or abdominal gases. The rhythm of the heart may be disturbed, one or more beats being missed at irregular intervals, and the sounds may become irregular, confused and tumultuous. These conditions may arise as a result of any chronic changes in the heart muscle, the valves or orifices.

Cardiac Murmurs.—These are of two kinds: (1) those originating within the heart known as endocardial murmurs, and (2) those originating outside of the heart known as exocardial, or pericardial friction murmurs.

1. *Endocardial murmurs.*—These are of two kinds: (a) Organic, (b) Functional.

Organic murmurs are due to organic changes in the valves. Functional murmurs are due to changes in the cardiac muscle, to changes in the blood, and are also found in general diseases.

a. *Organic endocardial murmurs.*—These are succinctly described by Hughes as follows:—

“When, from disease, the valves are not properly closed, the blood is allowed to flow back against the direct current, producing abnormal blood currents, to wit: When the mitral valve is incompetent, the blood flows from the left ventricle back into the left auricle during the cardiac systole, producing the mitral regurgitant, or indirect current; when the aortic valves are incompetent, the blood is permitted to flow from the aorta into the left ventricle during the cardiac diastole, producing the aortic regurgitant, or indirect current; when the tricuspid valves are incompetent, the blood flows from the right ventricle back into the right auricle during the systole, producing the tricuspid regurgitant, or indirect current; when the pulmonary valves are incompetent, the blood flows from the pulmonary artery into the right ventricle, producing the pulmonic regurgitant, or indirect current.

“The mitral direct current occurs during the contraction of the left auricle, or just before the first sound of the heart and immediately after the second sound. The aortic direct current is produced by the contraction of the left ventricle, and occurs with the first sound of the heart. The tricuspid direct current occurs during the contraction of the right auricle, or just before the first or immediately after the second sound. The pulmonic direct current is produced by the contraction of the right ventricle, occurring during its first sound. The mitral direct, or presystolic murmur, occurs before the first sound of the heart and

immediately after the second sound; it is caused by a narrowing of the mitral orifice, has a blubbery quality, well imitated by throwing the lips into vibration by the breath, of a low pitch, and it has its seat of greatest intensity at the cardiac apex, and is not transmitted to the left axilla or to the base of the heart.

"The mitral regurgitant, or systolic murmur, occurs with the first sound of the heart, resulting from the failure of the mitral valves to close the mitral orifice during the systole, in consequence of which the blood flows back, or regurgitates, into the left auricle. It is usually of a blowing or churning character, and has its seat of greatest intensity at the cardiac apex, being well transmitted to the left axilla and inferior angle of the left scapula.

"The aortic direct murmur occurs with the first sound of the heart. It is caused by a narrowing of the aortic orifice, has a rough or creaking character, is of high pitch, having its seat of greatest intensity in the second intercostal space, to the right of the sternum, and is well transmitted over the carotid artery.

"The aortic regurgitant murmur occurs with the second sound of the heart, and is caused by the failure of the aortic valves to close the aortic orifice during the diastole, permitting the blood to flow back or regurgitate into the left ventricle. It is usually of a blowing or churning character and of low pitch, having its seat of greatest intensity over the base of the heart, and is well transmitted downward toward or below the cardiac apex. It is the only organic murmur produced in the left side of the heart which occurs with the second sound of the heart.

"The tricuspid direct murmur occurs before the first sound of the heart, and immediately after the second sound. It is caused by a narrowing of the tricuspid orifice, has a blubbery quality, and is low in pitch, having its seat of greatest intensity near the ensiform cartilage. This murmur is exceedingly rare.

"The tricuspid regurgitant murmur occurs with the first sound of the heart, the result of the failure of the tricuspid valves to close the tricuspid orifice during the systole, thus allowing the blood to flow back or regurgitate into the right auricle. It is usually of a blowing or soft, churning character, having its seat of greatest intensity at the ensiform cartilage. This murmur is also very infrequent, and occurs mostly when the right ventricle is considerably dilated, and without the existence of any valvular disease.

"The pulmonic direct murmur occurs with the first sound of the heart. It is generally connected with congenital lesions. It occurs at the same instant that the aortic direct murmur occurs, and is distin-

guished from the latter by its not being transmitted into the carotid artery, whereas the aortic direct murmur is always thus transmitted.

"The pulmonary regurgitant murmur occurs, like the aortic regurgitant murmur, with the second sound of the heart. This murmur is exceedingly rare, and its presence is only positively differentiated from the aortic regurgitant murmur by the absence of aortic lesions and symptoms."

b. Functional endocardial murmurs.—These are "anemic murmurs" and are always associated with general anemic symptoms, and with the venous "hum" in the cervical veins. They are soft in character, are heard most distinctly during the systole at the base of the heart, to the left of the sternum, and are limited to the cardiac area. Moreover they are not associated with hypertrophy or other organic changes.

2. Exocardial Murmurs.—These are pericardial friction sounds caused by the rubbing together of the roughened surfaces of the pericardial membranes during the early stages of pericarditis. They are of a creaking, grating character like pleural friction sounds, but unlike the latter, they do not cease when the respiration is suspended. They are synchronous with the heart sounds, and are limited to the cardiac area.

I. DISEASES OF THE PERICARDIUM. PERICARDITIS.

Definition.—Inflammation of the Pericardium.

Varieties — (1) Plastic or fibrinous; (2) Pericarditis with effusion, or sero-fibrinous; (3) Purulent, or empyema of the pericardium; (4) Chronic adhesive. There is also a tuberculous pericarditis and a cancerous pericarditis, but, as primary affections, these are of extremely rare occurrence, being usually associated with tuberculous or cancerous disease of other organs.

1. Acute Plastic, Fibrinous, or Dry Pericarditis.

Pathology.—This is the most common form of pericarditis. The lesion is most often localized, but may be general. If localized, the base and the anterior surface of the heart are most often affected. At first the membrane is dry, congested, lusterless, and may present ecchymotic spots. Soon it becomes covered with a fibrinous exudate which presents a grayish, roughened appearance, entangled with which a slight serous effusion is always present. The fibrinous exudate may be thin and dry, may present a honey-combed appearance, or it

may appear in long shreds, presenting a shaggy, or hairy appearance. More often, however, the fibrin is more abundant, and presents the appearance of thickly buttered slices of bread which have been drawn apart, leaving irregular ridges. In mild cases the myocardium appears pale and turbid, but in more severe cases, myocarditis may be present, and sometimes constitutes a serious complication. Endocarditis is not an unusual complication, the disease in some instances spreading from one membrane to the other.

Etiology.— Osler gives the etiology of all varieties of pericarditis under one head. It may be best, however, to separately consider the causes of all save the two leading varieties, plastic and sero-fibrinous. These may be considered together, as the causes are identical, as indeed are also the lesions up to the stage when effusion makes its appearance.

Acute pericarditis may, in rare instances, occur primarily, especially in children. It also results from traumatism—either an external injury, or the passage of a foreign body, such as a pin, needle, or a fish bone, through the esophagus to the pericardium. Aside from these instances, which are of extremely rare occurrence, acute pericarditis is a secondary disease. In about one half the cases it is secondary to acute articular rheumatism, occurring in about one third of the cases of the latter disease. It may occur with mild or severe cases, and in some cases the pericardial inflammation precedes the articular. It may occur secondarily to chronic nephritis, and less often to acute infectious diseases—scarlet fever, puerperal fever, etc. It may be caused by direct extension of inflammation from adjacent tissues, such as pneumonia, pleurisy, peritonitis, or abscess of the liver. In double pleurisy, the pericardium is often involved. It frequently results from tuberculous pleurisy. It may result from disease of the aortic valves, or follow a myocarditis. It occurs at all ages, but more often in young adults.

In children, pericarditis is usually due to rheumatism or scarlet fever, but in advanced life it is more often associated with interstitial nephritis.

Symptoms.— In most cases, the symptoms are indefinite and masked by those of the primary disease, especially if that be acute articular rheumatism. It is only in very severe cases that the local symptoms are sufficiently pronounced to attract attention and expose the nature of the lesion. In rheumatic cases there may be some hyperpyrexia, but usually the fever is of a very mild character, or is entirely absent. The pulse is increased in frequency and strength, later becoming more weak and irregular, especially if there be myocarditis. Pain is present in most cases, but is usually described only as a sense of uneasiness or oppression, though in some instances it is very

distressing, resembling angina. It is usually referred to the precordia, or to the lower end of the sternum; in the former case sometimes extending to the left arm or back. Marked dyspnea and palpation are present only when there is an associated myocarditis.

Physical Signs.—*Palpation* usually reveals a friction fremitus, which is most marked over the right ventricle, caused by the rubbing together of the dry and inflamed pericardial membranes. *Auscultation* reveals the friction sound, which is the characteristic sign of the disease. It is of a grating or rubbing character, and, in the later stages, is loud and creaking, resembling the creaking of new leather. It is most often present during both the systole and diastole, but may only occur during one or the other. In rare instances, a triple rhythm is observed. It is not absolutely synchronous with the heart sounds, usually exceeding those in duration. The friction appears superficial, sounding very close to the ear, and is intensified by pressure with the stethoscope. It is best heard over the right ventricle, in the fourth and fifth spaces, near the sternum. In occasional instances, it is best heard at the extreme base, or apex. It is usually heard over small areas, though in rare instances it is audible over the whole pericardia. It is not transmitted in definite lines, as are endocardial murmurs. The friction sound is variable, coming and going, and changing character and point of maximum intensity without apparent cause.

Diagnosis.—The friction râle, while characteristic, is not an infallible sign, as it may be closely simulated by pleuritic frictions when they are modified by the heart movements, and may be present when there is complete calcification of the coronary arteries. It will, however, very clearly prevent the sounds being mistaken for endocardial murmurs.

Prognosis.—The prognosis as to life is always good, as simple plastic pericarditis never proves fatal. It may, however, only constitute the first stage of more severe and possibly fatal types of the disease. Complete resolution is exceptional, as the exudate becomes organized, and finally unites firmly the pericardial layers.

Treatment.—The patient should be kept quiet in bed, and allowed only light and easily digested food. The remedies required are usually those found most useful in rheumatic conditions.

Aconite (2x).—I consider this remedy the most useful and oftenest indicated in dry pericarditis, even though fever be entirely absent. It will, according to my experience, more quickly than any other remedy relieve the precordial pain and constriction, and especially when the pain extends into the left arm (*Rhus tox*). It is all the more strongly indicated if there be fever, anxiety, restlessness and a tendency to fainting.

Baehr gives the following symptoms as peculiar to Aconite and only occurring in diseases of the heart: "The beats of the heart become weaker, irregular, intermitting, or unequal, and at the same time the pulse is small, feeble, slower, and *not* synchronous to the beats of the heart; the temperature is lower, while the respirations increase."

According to Hale, if Aconite does not remove these symptoms of impending heart failure in a short time, it will be necessary to resort to *Digitalis* or some other true cardiac remedy. I consider digitalis of no value whatever in acute plastic pericarditis. It may be useful if there are signs of heart failure, though this is an exceedingly rare occurrence.

Veratrum viride (1x). — This remedy is most useful at the onset of idiopathic, or non-rheumatic, cases, occurring in plethoric persons where the characteristic strong, incompressible pulse is present, the action of the heart being very violent.

Colchicum (2x). — I have found this drug of great value in rheumatic cases. There is severe cardiac pain; heart's action weak and indistinct; pulse thread-like, scarcely perceptible; great oppression and dyspnea.

Spigelia (2x). — This is one of our most valuable remedies in dry pericarditis, especially when of rheumatic origin. Goodno says, "Of all which have been recommended, spigelia has given me the most favorable results. I hasten to give it as soon as the diagnosis is clear, if another medicine is not indicated. It is the remedy *par excellence* during the painful period, and until liquid effusion is pronounced." Fleischman of Vienna used no other remedy. The pains are stitching or sticking in character, sometimes synchronous with the heart beats. The action of the heart is rapid, violent and audible, and there is always a great dyspnea and anxiety.

Bryonia (2x). may be indicated and useful, but is more often called for after effusion has taken place, and especially in rheumatic cases.

Kalmia (2x). — A remedy of great value in rheumatic pericarditis. The heart beats are violent and accompanied by shooting, stabbing pains extending from the heart to the left scapula, with anxiety and dyspnea. It is only useful before effusion takes place.

2. Pericarditis with Effusion.

Synonym. — Sero-fibrinous Pericarditis.

Pathology. — The first stage corresponds with the lesions present in acute plastic pericarditis, though more pronounced. The second stage is that of effusion. A serous exudate containing desquamated

and proliferated endothelial cells, scanty pus corpuscles, and flocculi of fibrin is poured out to an amount varying from two to ten ounces. In old cachectic cases the serum contains a slight admixture of blood. A third stage is recognized,—the stage of absorption,—but which only occurs in favorable cases. In this stage there may be resolution and absorption of both fibrinous and serous exudate, but, as a rule, only the serous effusion is absorbed. The fibrin becomes organized into connective tissue adhesions; matting together the visceral and parietal membranes.

In some cases, especially tubercular, the serum is not absorbed and chronic sero-fibrinous pericarditis results. The heart muscle may become involved by extension and myocarditis of varying severity result.

Etiology.—The causes of sero-fibrinous pericarditis have already been considered in connection with those of the acute plastic variety.

Symptoms.—In primary cases, there may be an initial chill, fever, pain, rapid respiration, nausea and vomiting, such as are commonly found in connection with acute serous inflammations.

“In children, the disease may, like pleurisy, come on without local symptoms, and, after a week or two of failing health, slight fever, shortness of breath and increasing pallor, the physician may find, to his astonishment, signs of most extensive pericardial effusion.” (Osler.)

In secondary cases, the first stage corresponds exactly with that of acute plastic pericarditis, as already described. Simultaneously with the effusion, pressure symptoms make their appearance. Of these, dyspnea is the most important; and often is the first symptom, exciting suspicion as to the real character of the disease. The dyspnea is often very distressing, and is accompanied by a sense of oppression and discomfort in the cardiac region. The dyspnea may be aggravated by pressure on the left bronchus. Pressure or traction on the recurrent laryngeal nerve as it winds around the aorta, will produce hoarseness, or aphonia, laryngeal cough, and dyspnea, which may be spasmodic and distressing.

The patient is restless, lies upon the left side, or, as the effusion increases, sits up in bed. Associated with the dyspnea is, in many cases, a peculiarly dusky, anxious countenance. The pulse is rapid, small, sometimes regular, and may present the characters known as *pulsus paradoxus*, in which, during each inspiration, the pulse beat becomes very weak or is lost. These symptoms are due, in great part, to the direct mechanical effect of the fluid within the pericardium, which embarrasses the heart's action. (Osler.)

Physical Signs.—*Inspection* reveals a bulging of the precordia, especially in children. The intercostal spaces are effaced, and some-

times bulge out, even from moderate effusion, and with a copious effusion the antero-lateral region of the chest may be enlarged. Bulging of the precordia, without visible pulsation, is said to be distinctive of pericarditis with effusion. In the early stages, the apex beat is intensified, later is seen in an upward and outward direction, but after complete effusion has occurred, so that the heart is surrounded and pushed inward, the apex beat is entirely lost.

Palpation shows the apical beat displaced upward and outward or entirely absent, the cardiac impulse being entirely effaced. The strength and location of the apical beat is largely influenced by position, bending to the left side or forward causing its return. The friction fremitus is sometimes observed at the base, even after effusion, and usually can be easily felt after absorption takes place.

Percussion shows a greatly increased area of cardiac dullness, of a pyramidal shape, the apex being at about the second or third interspace and the base at the fifth, or even the sixth interspace, the level of the fluid being even with the liver, and for this reason not always easily defined. As the patient changes position, either lying upon the back or either side, the fluid gravitates and the dull area changes. Dullness in the right fifth intercostal space is, according to Rotch, a valuable diagnostic sign.

Auscultation reveals the friction râle at the base. More audible in the erect than in the recumbent posture. With absorption, the general friction râle returns. The heart sounds become feeble and muffled, and finally scarcely audible. According to Warthin, an early and persistent accentuation or clearness of the second sound may be present.

Diagnosis. — The diagnosis is often attended with great difficulty, though the triangular area of dullness and the friction sound will be all that is required in many cases to make a complete diagnosis. The disease is often overlooked and entirely unsuspected. In cases of rheumatism the heart should be constantly watched. The disease may be mistaken for acute pleurisy with effusion, but the pleuritic pain is not present. The pleuritic friction sound accompanies the respiratory movements, while the pericarditic friction sound does not, but corresponds closely to the beats of the heart.

The chief difficulty lies in distinguishing between this disease and a dilated heart. Anders gives the following differential table:—

Pericarditis with Effusion.

Cardiac Dilatation.

PREVIOUS HISTORY.

Recent history of gout, acute rheumatism, acute infectious or septic disease, scurvy, chronic nephritis, or tuberculosis,

Usual history of chronic and valvular disease of the heart,

CLINICAL HISTORY.

Fever and slight pain are usually associated.	No fever or pain, as a rule.
Nervous symptoms are often present.	Absent.

PHYSICAL SIGNS.

<i>Inspection</i> often reveals bulging (more marked in the young). Apex beat pushed up, is feeble, and later absent.	Apex beat usually visible, wavy and diffused.
Heart's impulse usually absent. Friction fremitus may be present over the base.	Though feeble, the impulse is palpable.
<i>Percussion</i> shows a triangular flat area, and the boundary line above changes on altering the position. There is dull tympany in the axillary or sub-scapular region.	Dull area varies with chambers dilated; usually it is coextensive with a wavy impulse, and does not extend so high (except in mitral stenosis), and does not vary with change of position. No dull tympany.
<i>Auscultation</i> shows the first sound distant and muffled; the friction rub is often double over the base.	First sound clear, short and sharp. No friction murmur present, but an endocardial murmur or murmurs may appear.

Prognosis.—The prognosis, as a rule, is good. Most cases recover. If complicated with endocarditis or an extensive myocarditis the results are more doubtful. So also in septic cases, and those occurring in old people who have Bright's disease. It is claimed that the prognosis of cases occurring with pneumonia is better than that of any other form. If death occurs in cases with large effusion, it results from asthenia, usually about the second or third week.

Treatment.—The indications for treatment during the first stage are precisely the same as have already been enumerated for acute plastic pericarditis. During the stage of effusion the first and most important essential is that the patient be kept absolutely quiet in bed in the recumbent posture, all motion or mental annoyance or excitement being rigidly prohibited. Flannel underwear should be worn, and it is a good plan to keep the patient between blankets. Hot poultices or fomentations should be applied over the heart, a flannel being first placed next the skin to prevent the first shock of overheating. I prefer the continuous heat obtained through a rubber coil. Cold applications are recommended by some, but their use has proved very unsatisfactory in my own experience and that of many others. Stimulants are to be used cautiously and only in case of impending heart

failure. If the embarrassed heart action be due to pressure from the effusion, then aspiration is indicated, and stimulants would only tend to aggravate the patient's condition. If at any time the respiration becomes very labored and cyanotic symptoms with a feeble, rapid pulse become manifest, cardiocentesis is indicated, and promises much if not too long delayed. It is best to make an exploratory incision with a hypodermic needle before attempting aspiration. The puncture should be made in the fifth left interspace about two inches from the sternum. Not more than two or three ounces of liquid should be withdrawn at one time, the operation being repeated if necessary. The strictest asepsis should be observed.

Homœopathic remedies are of great service in the treatment of pericarditis with effusion. They should be administered on their strict indications, and not alone from the standpoint of their physiological action.

Bryonia (2x).—This remedy as in other serous inflammations, is frequently the first remedy called for after Aconite or Verat. vir. have ceased to be indicated. It is rarely useful, however, in the later stages of effusion. Not only does Bryonia cover the ground physiologically as a rheumatic remedy as well as possessing a specific affinity for serous membranes, causing both serous and plastic exudations, but it often covers the totality of the symptoms, though not so completely, as a rule, as it does in pleurisy. Stitching pains and aggravation on motion are its chief indications.

Arsenicum (3x).—This drug is of great value after the effusion is well developed. It is to be prescribed solely on its symptomatic indications. It will often afford great relief to the anxiety and dyspnea before the exudate is removed. The pulse is small, quick, and irritable; lies with the head high; great dyspnea with anxiety; restlessness; characteristic thirst; prostration.

Digitalis (1x).—This drug is of no value in the first stage, but after effusion has occurred and symptoms of weak heart action develop, there is usually no drug so useful. There is a great anxiety and oppression, dyspnea, sudden sensation as if the heart stood still, pulse feeble, irregular, fluttering, intermittent, or extremely slow; any motion, especially rising from a bed or chair, causes the pulse to become rapid, weak, and jerky, sometimes cyanosis and even syncope. In such cases I use the 1x dilution, frequently repeated. Many consider it quite necessary to use an infusion in diuretic doses.

Kali iod. (1x).—This drug promotes the absorption of the exudate. Hale says it is "useful only during the period of effusion, when the rubbing sounds are present, or when serum is rapidly collecting. It is

indicated in the great dyspnea from excess of tough bronchial secretion or pericardial effusion. I have seen the best effects from the iodides when given alternately with *Digitalis*. It is indicated in weakness of the cardiac muscle, from embarrassed action owing to pressure from effused fluid. The iodide of ammonium is often more active than the potassium salt. In order to get its specific action, it must be given in doses of at least five grains every four hours. *Sulphur* follows *Kali iod.*, and rivals it in pericardial exudations."

3. Purulent Pericarditis.

Synonym.—Empyema of the Pericardium.

Pathology.—The pericardium is much thickened and covered with a thick layer of fibrin and pus, beneath which is a granular surface, and sometimes distinct points of ulceration. The effusion is usually abundant and always distinctly purulent. The myocardium is always more or less involved, usually undergoing fatty degeneration, and appearing pale, soft, and fragile.

Etiology.—Purulent pericarditis may follow the sero-fibrinous variety, but more often it is a sequel of tuberculous or septic processes involving the pericardium, including the acute infectious diseases. It may result from infecting a serous effusion by the use of an infected aspirating needle.

Symptoms.—The symptoms and physical signs are essentially the same as in the sero-fibrinous variety, plus septic symptoms—erratic chills followed by sudden rises in temperature, cold sweating, rapid and feeble pulse, diarrhea, great prostration, and a low form of delirium.

When occurring in the course of a septic disease, the latter symptoms may not be attributed to their proper source, and the purulent condition of the pericardium be overlooked. The symptoms of involvement of the myocardium are more pronounced than in the sero-fibrinous form.

Diagnosis.—The presence of the symptoms and signs of pericardial effusion, with evidences of sepsis, warrant the use of the hypodermic needle for diagnostic purposes, this being the only reliable method, and perfectly safe if carefully performed.

Prognosis.—The prognosis is almost invariably bad. Often death results from the primary septic disease or from the associated myocarditis. Even if the exudation be withdrawn and does not recur, chronic adhesive pericarditis results or there may remain a chronic suppurating surface discharging its contents through a thoracic fistula.

Treatment.—While such remedies as *Arsen.* (3x), *Ars. iod.* (2x), *Merc.* (3x), *Hepar.* (3x), *Silic.* (6x) and *Sulph.* (6x), may to some extent

control the suppurative process, yet as a rule the disease is a surgical one, and requires free incision and drainage.

4. Chronic Adhesive Pericarditis.

Synonyms.—Chronic Pericarditis, Adherent Pericarditis.

Pathology and Etiology.—Chronic pericarditis follows the acute varieties, either plastic or sero-fibrinous, and may be either partial or general. It may also follow the purulent form. The pericardium is thickened, and a connective tissue formation causes the opposing surfaces to be firmly adherent, the degree of thickening and extent of the adhesions depending upon the extent and severity of the primary acute attack. In some cases the membrane becomes covered with a cheesy matter and calcareous infiltrations occur, forming a more or less complete bony casing about the heart. If the adhesions do not interfere with the heart's action there may be little or no change in its structure, but, if the contrary, hypertrophy takes place, compensation being thus established. Dilatation and degenerative changes take place, and ultimately lead to heart failure.

Symptoms.—Symptoms of chronic pericarditis are indefinite and unreliable, and are often unrecognized through life. It is only when changes in the heart muscle take place—hypertrophic dilatation and fatty degeneration, with consequent enfeeblement of cardiac power and threatened heart failure—that definite symptoms are recognized; and these, as a rule, do not indicate the character of the primary disease. The pulse becomes rapid, feeble and irregular, and the *pulsus paradoxus* has been observed. Rarely attacks of angina and sudden death occur.

Physical Signs.—Physical signs are not invariably present, but usually they are observed as follows:—

Inspection.—The intercostal spaces overlying the heart may be depressed, and during the systole there may be noticed a retraction of the chest wall over the whole heart area, or, more often, over the apical area only. The former indicates extensive adhesions. If with the systolic retraction there is also noticed the “diastolic shock,”—a forcible diastolic rebound,—a strong diagnostic point is established. Often when the latter is not visible, it can be readily felt on palpation. The sudden collapse of the cervical veins during diastole is considered diagnostic, but Anders and others have observed this in cardiac dilatation without adhesions. The fixed position of the apex beat when the patient is turned on his left side is a confirmatory sign.

Percussion.—An increased area of cardiac dullness is observed, especially upward and to the left, and the fixed position of the heart is confirmed.

Auscultation. — This is somewhat negative. Various murmurs may or may not be present, but are of no diagnostic value. When dilatation is advanced, the usual signs of that condition are observed.

Diagnosis. — Even with the observation of the physical signs above noted the diagnosis is usually attended with great difficulty. The condition is quite liable to be confounded with chronic myocarditis and hypertrophic dilatation, both of which are frequently associated with chronic pericarditis. If dilatation complicate the case, it may be mistaken for pericarditis with effusion; but in the latter case, the apex beat is located higher up, is less undulatory (may be absent in large effusions), the heart sounds are more muffled, there is an absence of systolic retraction and diastolic concussion, the limits of dullness are variable, but retain the pyramidal form.

Prognosis. — The prognosis is bad. Death usually results from the compensation's being destroyed by myocardial degeneration and consequent dilatation. Sudden death is not uncommon.

Treatment. — The treatment is purely symptomatic, remedies being given for the relief of existing symptoms according to individual indications.

HYDROPERICARDIUM.

Synonym. — Dropsy of the pericardium.

Definition. — A serous effusion within the pericardium unaccompanied by symptoms or signs of inflammation.

Pathology. — The fluid may range in quantity from an ounce to one or two pints, and is of a clear, yellowish or straw-colored serum, at times turbid or bloody, and of an alkaline reaction. In rare cases the effusion has a milky appearance — chylo-pericardium. If the amount of the fluid be large, the sac is dilated, its walls thinned by the pressure, and has a sodden appearance.

Etiology. — Hydropericardium is usually a part of general dropsy, either renal or cardiac. In such cases it often comes on with hydrothorax, and its presence is overlooked. It is said to be especially liable to result from Bright's disease, and sometimes follows post-scarlatinal nephritis. It may result from pressure of an aneurysm or other mediastinal tumor, or from disease or thrombosis of the cardiac veins.

Symptoms. — Hydropericardium presents no definite symptoms. Dyspnea is always present, and there may be disturbed heart action, dysphagia, dry cough and feeble circulation, especially if the condition be associated with hydrothorax, as is often the case. The physical signs are identical with those of pericarditis with effusion, except that there are no friction sounds and no bulging.

The *diagnosis* rests entirely upon the history of the case and the physical signs. The *prognosis* depends entirely upon the nature of the cause. The *treatment* is the same as for pericarditis with effusion. If the accumulation of serum be large, aspiration may be required.

PNEUMOPERICARDIUM.

Definition.—Air in the pericardium. There is usually also pus and sometimes blood.

Etiology.—Pneumopericardium is caused by penetrating wounds of the chest; perforation of the lungs, esophagus or stomach; rarely from the decomposition of a pericardial exudate.

Symptoms.—Pericarditis is always induced, and the symptoms are those characteristic of that disease, with more intense dyspnea.

“The physical signs are remarkable. When the effusion is copious, the fluid and gas together give a movable area of percussion dullness, with marked tympany in the region of the gas. On auscultation, remarkable splashing, churning, metallic phenomena are heard with friction, and possibly feeble, distant heart sounds. Death follows rapidly. Except as a result of injury, the condition is not one for which treatment is available.” (Osler.)

II. DISEASES OF THE HEART.

ENDOCARDITIS.

Definition.—Inflammation of the lining membrane of the heart, affecting usually the valves and their immediate vicinity. It may be either acute or chronic.

ACUTE ENDOCARDITIS.

Pathology.—The endocardium being a connective tissue membrane, its inflammations are of a cellular rather than of an exudative type. Three grades of severity are recognized: (1) Simple swelling of the valve segments, their surfaces remaining smooth. (2) Swelling of the valve segments with their surfaces covered more or less with granular vegetations (new cell growths), being more especially numerous at their lines of maximum contact when closed. (3) The vegetations are excessive and undergo necrosis, leading to ulceration and even perforation of the valve. The mitral valve is most often affected, then the mitral and aortic, but rarely the aortic alone.

The first two varieties mentioned are usually designated as simple

endocarditis, and the last as malignant or ulcerative endocarditis. The disease is usually limited to the left side of the heart, though when occurring during fetal life, the right side is exclusively involved. Congestion of the vessels beneath the membrane takes place, causing hyperemia. An exudation of serum and lymph occurs beneath and on the free surface of the membrane of the valves and chordæ tendineæ, which results in "roughening of the surfaces and the agglutination of the mitral valves to each other, and of the aortic segments to the walls of the aorta, or the proliferation of the endocardial connective tissue, forming the nuclei of the so-called warty excrescences or vegetations, their size being increased by the deposition of fibrin from the blood within the cavities of the heart."

The vegetations may become detached by the force of the blood current and be carried to the peripheral arteries producing embolism in various organs, especially the left side of the brain, the kidneys, and the spleen. These infarcts may be very few in number, or there may be thousands of minute abscesses scattered throughout the body. In simple endocarditis the emboli are not infective. In the ulcerative form softening of the fibrinous deposits takes place, resulting in ulcerations and perforations. The ulcerative process has a tendency to spread, and destroys more or less of the endocardium. According to Osler, "The changes due to embolism constitute the most striking features, but it is remarkable that in some instances, even with endocarditis of a markedly ulcerative character, there may be no trace of embolic processes."

Incompetency of the diseased valve results from stenosis or insufficiency, or from both. The inflammation may extend to the myocardium in a mild degree, and thus weaken the power of the heart. Pericarditis is a frequent complication. Acute attacks frequently occur in those suffering from chronic endocarditis.

Etiology.—Simple endocarditis is never a primary disease, but is always associated with some other affection. The most frequent cause is acute articular rheumatism, it being variously estimated that from forty to eighty per cent of all cases are due to this disease. Especially is endocarditis liable to follow rheumatism in young subjects. The appearance of endocarditis is not influenced by the severity of the rheumatic attack, as it sometimes follows very mild cases. The disease sometimes complicates scarlet fever, but rarely other exanthematous or infectious diseases. It is occasionally associated with pneumonia and pulmonary tuberculosis. It is of comparative frequency in connection with the more serious forms of chorea. According to Osler, "There is no disease in which post-mortem acute endocarditis

has so frequently been found." Malignant endocarditis is also known as septic, ulcerative, diphtheritic, bacterial and mycotic endocarditis, and as arterial pyemia. It may occur primarily, but is usually secondary to acute rheumatism, pneumonia and septic conditions, such as any form of puerperal sepsis, septic wounds, and septic diseases in general. Cases have been known to follow suppurative phlebitis from ear disease, erysipelas, diphtheria, suppurative pyelophlebitis, osteomyelitis, dysentery, abscesses and gonorrhea. It is presumed that the exciting causes of malignant endocarditis is the infection of the endocardium by bacteria, the specific irritant being supposed to be the *streptococcus pyogenes* (Fraenkel and Sanger). In the absence of the streptococcus the bacillus diphtheriæ, however, as well as the bacillus coli, the bacillus anthracis, the pneumococcus, the gonococcus, and other organisms, have been found.

Symptoms.—Simple endocarditis rarely gives rise to any definite symptoms or characteristic physical signs. Some patients complain of pain or distress in the precordial region, sometimes of a pain extending down the left arm, a sense of heaviness, a feeling as if the heart were being squeezed, dyspnea and palpitation. Rarely is the temperature increased. Embolism, the indications of which will be noticed later, seldom occurs in simple endocarditis. "The great majority of cases are latent, and there is no indication whatever of cardiac mischief. Experience has taught us that endocarditis is frequently found post-mortem in persons in whom it was not suspected during life." (Osler.)

Malignant endocarditis presents no distinct or characteristic symptom other than those of constitutional sepsis, and symptoms of valvular lesion or of infective emboli. The symptoms above mentioned in connection with simple endocarditis may be present in a more aggravated form. The symptoms of sepsis are often well pronounced, but on account of the primary septic condition, in the absence of cardiac symptoms, it is not always that endocarditis is suspected. In such cases frequent rigors, irregular temperature, sweating and prostration are present. There is always a decided tendency toward a typhoid state—headache, restlessness, varying delirium, coated, dry tongue, sordes on teeth and lips, nausea, vomiting, loose or disordered stools, enlarged spleen, and albumen in urine. The temperature curve is always irregularly intermittent, sometimes reaching as high as 105° to 106° F. In some cases cardiac symptoms are prominent, the result of sudden and severe valvular lesion. Valvular murmurs are heard according to the valve affected, but the action of the heart is often so irregular and tumultuous that the rhythm of the murmurs can not be

determined. In some cases, especially when the lesion is located in the ventricular endocardium, there may be no murmur at all. In three fourths of the cases there are present the physical signs of antecedent valvular disease. In these cases also there is usually a typhoid tendency. A frequent symptom of malignant endocarditis is a peculiar *facies*, indicative of a sense of impending danger, great anxiety or terror. Emboli give rise to a variety of symptoms depending upon the localization of the embolus. If in the gastro-intestinal tract there is vomiting and diarrhea; symptoms of local peritonitis, with splenic abscesses if the spleen is affected; abscess of the lungs, empyema, or septic pneumonia, if the lungs are involved; abscesses of the liver; lumbar pain, and hematuria from kidney infection; impaired vision from retinal hemorrhage; if the brain is the seat of the embolus, there are rapidly developing paralyses, according to its situation in the brain, with disordered consciousness. If abscess of the brain or meningitis occur, there is usually a furious delirium. Cutaneous emboli produce petechial rashes. In some cases there are also multiple skin abscesses, giving the patient an appearance suggestive of hemorrhagic smallpox.

Physical Signs.—Acute endocarditis affords few or no characteristic signs, outside of those due to valvular lesions in case the valves are affected, which is far from being a constant condition. When such is the case, there are various murmurs heard, according to the valve affected, these being often marked by the tumultuous action of the heart. If with the latter there is a small feeble pulse, endocarditis is suggested. Diastolic murmurs are exceedingly rare. The most common murmur is systolic—a soft, blowing sound, due to mitral insufficiency, the mitral segments being the favorite seat of the disease. This sound is heard best at the apex. Sometimes there is dilatation of the left ventricle, with the physical signs elsewhere considered.

Diagnosis.—The diagnosis of simple endocarditis rests upon the physical signs which are exceedingly untrustworthy. Many cases pass undetected during life. The soft, bellows murmur is so common in other diseases that it can not be depended upon. Endocarditis is sometimes present when no murmurs are to be heard. In differentiating from pericarditis it should be remembered that in the latter the murmur or friction sound is heard with either sound, is near to the ear and influenced by pressure of the stethoscope, besides being associated with more or less alteration in the size and shape of the cardiac dullness, and is not transmitted, while in endocarditis the murmur takes the place of, or is associated with, the cardiac sounds, and is transmitted with the absence of change or increased dullness or percussion. When, as sometimes happens in rheumatic cases, both endocarditis and

pericarditis exist in the same patient, the signs of the former are masked by the pericardial friction sound, and later by the effusion.

The diagnosis of malignant endocarditis is extremely difficult, its symptoms being almost invariably masked by those of the primary septic condition. A combination of septic symptoms with those of a cardiac disease and the various embolic phenomena are sometimes sufficient to establish the diagnosis. If either of these be absent and the case assumes a typhoid form, it may not be possible to distinguish it from typhoid fever. Anders gives the following diagnostic table:—

Ulcerative Endocarditis.	Typhoid Fever.
Previous or associated disease, as acute rheumatism or pneumonia.	Health good before the time of onset of the attack. History of epidemic.
Very rarely a primary affection. No prodromes observable.	Always idiopathic, with a prodromal stage.
Ushered in suddenly by a severe rigor, which may recur.	Invasion marked by slight recurring chilly sensations. (Severe chill very rarely.)
The fever rises rapidly.	More gradually, in steplike fashion.
Profound prostration as early as third day.	Profound prostration not earlier than seventh day.
The fever is markedly irregular from time of onset, as a rule.	Less so, especially in the first week.
Embolic symptoms (hemiplegia, etc.) may appear.	Extremely rare.
Cardiac symptoms, especially loud systolic murmur, often present.	Sometimes a soft systolic murmur.
The blood usually shows signs of septic leukocytosis.	The blood shows a decrease in the number of leukocytes.

Prognosis.— In simple acute endocarditis, the prognosis as to life is almost invariably favorable, unless complicated by a severe pericarditis or myocarditis, or when repeated attacks occur in a case of chronic endocarditis. Unfortunately, many cases leave permanent lesions of the valves. Few cases of malignant endocarditis recover. Those of an acute character and running a rapid course, are usually fatal in the course of two or three weeks. Other cases run a slower course, lasting for several weeks and sometimes for months. Such cases may recover, especially if compensation be maintained and embolism does not occur.

Treatment.— Rest and quiet are of the utmost importance, not only during the attack, but also during convalescence, and even for weeks after apparent recovery. The patient should be kept in bed, and perfect quiet enjoined. There should be no bodily exertion

whatever allowed. Either the patient should wear flannels, or lie between flannel blankets, it being important that the heat of the body be sustained, and especially, that the chest be kept warm, which is sometimes best accomplished by a light, cotton jacket. The diet should be light and nutritious, consisting chiefly of milk and nitrogenous foods. Coffee, tea, and other stimulating drinks are to be avoided. If pain is severe, hot applications are demanded. In case of threatened heart failure, stimulants must be employed. I prefer aromatic ammonia, but whisky and brandy may be used in abundance, if required, also caffeine in one- to three-grain doses, and in bad cases, hypodermic injections of strychnia.

Therapeutics.—Aconite (1x).—In a general way Aconite stands at the head of all remedies during the first stage of endocarditis, not only in sthenic cases, but to some extent in all cases, even when no temperature is present. Both in its symptoms and its pathology, aconite comes the nearest a *similimum* to simple endocarditis of any drug in the *Materia Medica*. It is especially useful when there is an associated pericarditis. Its chief symptoms are high temperature, pulse small, rapid and hard, faster than the heart beats, difficult breathing, stitching pains, oppression and great anxiety. In the later stages the pulse is thready and irregular, heart beats almost imperceptible, skin cold and clammy, great anxiety. In such instances it will often afford at least temporary benefit.

Veratrum viride (1x).—This drug is highly extolled for endocarditis, where the violence of the sthenic symptoms are the chief indication. Hale (Arndt's System of Medicine) says it "is equally important with Aconite, but the indications are quite different. The action of the heart is more violent, more forcible in its stroke upon the wall of the chest. The blood pressure is stronger, the temperature higher, the pulse always large, hard, bounding, and unyielding, and this intense impulse is noticeable in the temporal arteries. It is better adapted to idiopathic endocarditis than Aconite. There are no distinctive symptoms of the chest which indicate it, for all remedies have the dyspnea and oppression. As Veratrum viride is our greatest remedy in acute congestion of the lungs, so in endocarditis it is a powerful agent to prevent such a complication. Some cases of endocarditis are ushered in by a violent congestion of the brain and medulla that often masks the cardiac trouble. Here Veratrum viride, if given boldly, is certain to prevent serious injury to the cerebro-spinal centers. Like Aconite, it should not be continued too long. So soon as the pulse becomes softer, and the temperature lowers, it should be given at longer intervals, or discontinued. A *quick* pulse is not necessary to indicate this drug."

Belladonna (2x).—I have satisfactorily employed Belladonna where the symptoms of violent congestion were prominent, associated with flushed face, throbbing carotids and bounding pulse. The latter symptoms are about all that differentiate the drug in such cases from Verat. vir. Frequently the conjunctivæ are injected and the pupils dilated. In cases preceded by cerebral congestion I consider it more often indicated than Veratrum.

Bryonia (2x).—This remedy is often of value in rheumatic cases, following well after Aconite, Verat. vir., or Bell. Hale says "It corresponds perfectly to those varieties of acute rheumatism which are associated with inflammation of the endocardium. This membrane is structurally a serous membrane, and Bryonia has a specific affinity for it, causing in all serous membranes an inflammation resulting in effusion of serum, plastic lymph, or vegetations. No remedy is, therefore, more homœopathic to valvulitis with vegetations or thickening. Bryonia has high fever, a very intense frontal or occipital headache, aggravation of the pain on slightest movement, dyspnea and valvular murmurs. These, and the character of the attending or preceding rheumatism, must be the indications for Bryonia."

Spigelia (2x).—After Aconite I consider Spigelia the most frequently indicated and most generally useful remedy we have for endocarditis. Some give it indiscriminately in all cases, but this practice is reprehensible. It is equally useful in the early and later stages, and in chronic forms. Tumultuous action of the heart, both visible and audible; undulating, wave-like motion of the heart not synchronous with the radial pulse; purring feeling over the heart; trembling in the heart; suffocative attacks; great dyspnea on slightest motion, etc.

Cactus (2x).—This remedy is frequently useful when there is present the characteristic sensation of an iron band constricting the heart and preventing its normal movement, with great dyspnea and anxiety. Pains in apex of heart, shooting down left arm to ends of fingers; feeble pulse. Endocardial murmurs; excessive impulse; increased precordial dullness; enlarged ventricle. Irregularity of the heart's action; at times frequent, at others slow. Occipital headache.

Digitalis (Tincture).—The frequent usefulness of Digitalis in cardiac diseases has led to its indiscriminate employment regardless of its symptomatic indications, and often without a proper knowledge of its physiological action. Whether given in a general way, or with the specific idea of "aiding compensation," Digitalis is only useful when the symptoms of the case correspond to those of its pathogenesis. It is rarely useful in the first stage of endocarditis, but may be of benefit where there is a great anxiety and oppression, dyspnea, sudden sensa-

tion as if the heart stood still; pulse feeble, irregular, fluttering, intermittent or extremely slow; any motion, especially rising from a bed or chair, causes the pulse to become rapid, weak and jerky, sometimes cyanosis and even syncope. It should be given only in small doses. Many prefer the 2x dil. If given in large doses, the ultimate results are disastrous, the drug soon producing its characteristic physiological effects, weakness of the heart muscle, dilatation, etc., and thus hastening a fatal termination. Later on when the heart muscle shows signs of failure, the pulse being rapid and feeble or irregular and feeble, or feeble, slow and intermittent, with an apparent forcible heart action, which is, however, without force, Digitalis should be given in tincture from one to ten drops at a dose according to the necessities of the case. Hale says, "In several cases which I have on record, I am satisfied that life was saved by the administration of Aromatic Ammonia and Digitalis, fifteen drops of the former to five of the latter, in a spoonful of milk or sweetened water every half hour till reaction occurred."

Colchicum (2x). — This remedy is of especial value when sudden metastasis occurs in the course of acute rheumatism. There are severe tearing pains in the cardiac region, with violent heart action and accelerated and hard or full and slow pulse. In other cases the heart's action is weak and indistinct; pulse thread-like, scarcely perceptible; great oppression and dyspnea.

Cimicifuga (1x). — This drug may be useful in cases following muscular rheumatism or chorea, especially if there is delayed or suppressed menstruation. Particularly in cases where there is an associated myocarditis. The general symptoms of the drug agreeing.

Chininum Arsenicosum (2x). — This remedy stands at the head of all others for malignant endocarditis. It should be given only in small doses (2x), as quinine in large doses is a dangerous drug in endocarditis. It not only covers the septic condition, but also gives some characteristic heart symptoms. Sensation as if the heart had stopped; beats not perceptible; action irregular. *Pulse small; very frequent; irregular; great exhaustion.*

Arsenic (3x). — Also useful in the malignant form on account of its power to neutralize and control septic conditions. There is a rapid, feeble pulse; great restlessness and anxiety; great prostration; dyspnea; and other symptoms characteristic of the drug. In malignant endocarditis also consult *Lachesis* (6.), *Crotalus* (3), *Naja* (3), *Phosphorus* (3x), and *Secale* (3x).

Chronic Endocarditis consists only in the consequences of acute endocarditis — valvular diseases, dilatation, etc., each of which will be fully considered elsewhere.

VALVULAR DISEASE.

Definition.—Valvular diseases include such changes in the structure of the valves of the heart or of their orifices, which render the valves incapable of properly closing. These are of two kinds known as obstructive and regurgitant. In the former the orifice is so narrowed that there is obstruction to the passage of the blood, and, in the latter, the valves are so altered that the blood is permitted to regurgitate. The former is known as stenosis, and the latter as incompetency or insufficiency. These lesions may occur at four points: on the left side, at the auriculo-ventricular orifice (mitral) at the aortic orifice (semilunar); on the right side, at the auriculo-ventricular orifice (tricuspid), at the pulmonary orifice (semilunar).

Etiology.—The two general causes that operate most frequently in the production of valvular disease are chronic endocarditis and arterial sclerosis or atheroma, the former being by far the most important. Endocarditis affects all the valves, but the mitral most often; atheroma usually the aortic orifice. Endocarditis with mitral changes mostly occurs in the young and middle aged; atheroma in old people. Syphilis is also considered to be a cause, syphilitic gummata being deposited on the valves as well as on the myocœrdium. Heavy muscular labor, overwork, and repeated straining efforts increase the arterial tension, cause a continuous strain of the heart and ultimately result in valvular disease, especially aortic. The mechanical effect of the various lesions presented in valvular disease and the character of the consequent murmurs have already been sufficiently considered under the head of "methods of diagnosis." It will now only be necessary to note briefly the anatomical changes found in each variety.

Mitral Incompetency.

Synonyms.—Mitral Regurgitation, Mitral Insufficiency.

Pathology.—This is the most frequent form of valvular disease constituting over one half of all cases of organic heart disease. It consists in an imperfect closure of the mitral valve. According to Anders, "The predominating lesions are of three kinds: (*a*) Acute or chronic endocarditis, leading to contraction and deformity, particularly curling, of the margins of the valve; (*b*) contraction (shortening) of the chordæ tendineæ; and (*c*) relative insufficiency from excessive dilatation of the left ventricle (the segments being healthy). Adhesion of a segment with the walls of the ventricle occurs rarely, but may result in incompetency."

Etiology.—Mitral incompetency occurs most often during young

adult life, and somewhat oftener in males than in females. The direct causes are: (1) Contraction or shortening of the valve segments from chronic rheumatic endocarditis, frequently associated with changes in the chordæ tendineæ and with more or less narrowing of the orifice. (2) Defective muscular closure, resulting either from endocarditis, myocarditis or from weakening of the heart muscle in anemia and prolonged fever. (3) Dilatation of the mitral ring from excessive dilatation of the left ventricle. (4) It may occur secondarily, in the course of aortic valvular disease, from an undue tension of the blood in the left ventricle. (5) It may be due to calcareous deposits at the base of the valve. "In long-standing cases the entire mitral structures are connected into a firm calcareous ring." (Osler.)

Symptoms.—So long as compensation is good there may be an entire absence of symptoms, even for a very long time. Occasionally there may be some palpitation and dyspnea on exercising or going up stairs, and a slight cyanotic appearance of the lips and ears. This is due to pulmonary congestion which may also cause occasional attacks of bronchitis or hemoptysis. Dyspnea is the chief, and sometimes the only feature in such cases, the patient having a more or less slight shortness of breath, according to the severity of the exercise indulged in, from which he may complain for years without disease of the heart being suspected. According to Osler, there is a clubbing of the finger nails in long-standing cases, particularly in children. If compensation fails, — that is, if the right ventricle fails to force the normal quantity of blood through the left heart, — we then obtain more marked symptoms of pulmonary engorgement. There are palpitation, weak, irregular action of the heart, dyspnea, more or less constant, with developing orthopnea, and cough, with bloody or watery expectoration. Osler mentions in particular a distressing symptom of "sleep-start," in which "just as the patient falls asleep, he wakes gasping and feeling as if the heart were stopping." I have seen this symptom many times in these cases. There is little pain unless stenosis coexists. Cyanosis of the surface is present in a mild degree, and sometimes the skin is jaundiced. The urine is usually scanty and albuminous, and contains tube casts and blood corpuscles. Dropsical effusion follows, beginning first in the feet and spreading upward until the body and the serous sacs are involved. At this stage, if treatment be successful, and the compensation restored, the patient will temporarily recover, but subsequent attacks become more frequent and severe, and finally, in all cases, the time comes when compensation can not be restored, and the patient dies from general dropsy and venous congestions, or the usual results of dilatation. Sudden death rarely occurs.

Physical Signs.—*Inspection.*—The apex beat is displaced to the left and downward. In children and young people particularly, there is bulging of the precordia and the area of the apex beat is increased and may become wavy.

Palpation.—The displaced apex beat is observed, being in the early stage forcible and diffused, but, as compensation fails, wavy and feeble or entirely absent.

Percussion.—Cardiac dullness is measured in a transverse and vertical direction, especially the former, extending beyond the right margin of the sternum to the left of the nipple.

Auscultation.—There is heard a systolic blowing, churning murmur (sometimes a musical tone), with its maximum intensity at the apex, and transmitted to the left as far as the angle of the scapula, with progressively diminishing clearness. It may sometimes be heard in the recumbent position, when not heard in the erect, and *vice versa*, and when absent may be produced by deep respirations or exertion. The character of the murmur gives no indication of the degree of incompetence. In some instances the murmur has its maximum intensity in the mitral area. If there be an associated mitral stenosis, there may be heard the rumbling or purring presystolic murmur. A systolic thrill is sometimes heard at the apex and when present is of great diagnostic value. In the second or third interspace to the left of the sternum, may be heard, in nearly all cases, the accentuated pulmonic second sound. There are present the usual physical signs of hypertrophy. If late in the disease, secondary dilatation of the right ventricle occurs, there is heard at the ensiform cartilage the characteristic soft, low-pitched, 'systolic' murmur, due to tricuspid insufficiency. The pulse may be normal or irregular, the latter being the rule after compensation fails.

Diagnosis.—The diagnosis is comparatively easy. It is based upon the systolic murmur at the apex, and which, reflected to the left axilla, may even be heard at the back; the accentuation of the pulmonary second sound; and the enlarged transverse area of dullness. At all times the history of the case is of great importance, and often of greater value than the physical signs. The most frequent error is confounding functional and other harmless murmurs with mitral insufficiency. In such cases the history of the case is of chief importance. There will be found no rheumatic history and no symptoms of organic heart lesion, but usually a history of some variety of anemia or Grave's disease. The diagnosis of relative incompetence is difficult, and rests chiefly upon a history of anemia, renal disease, syphilis or alcoholism. It may also be present in arterio-sclerosis and aortic stenosis or aortic incompetence.

Prognosis.—Mitral incompetency is supposed to be the least serious of all the valvular lesions. Probably on account of the fact that it usually occurs in young subjects, in whom compensation is more readily established and maintained. In a large proportion of cases, life is not materially shortened. Should compensation fail and persist in spite of treatment, the prognosis is naturally unfavorable. If dilatation supervenes, the patient soon dies, either from congestion of the lungs or dropsy and exhaustion.

Mitral Stenosis.

Definition.—A narrowing or constriction of the mitral orifice. Often associated with mitral incompetency.

Pathology.—The mitral orifice is in a state of constriction or stenosis, varying in degree, and may at the same time present a roughened, uneven surface, causing irregularity and thickening. The presence of more or less abundant vegetations on the valves may have much to do with the existing obstruction. In some instances the valves adhere together and thus form a funnel-shaped opening. This variety is common in children, but rare in adults.

Etiology.—Mitral stenosis is, as a rule, due to acute endocarditis and its consequences. It is more common in children after the fifth year and in young adult persons, and is more frequent in females than in males. Osler believes that whooping-cough, by the great strain it produces upon the heart valves, may be accountable for some cases of mitral stenosis. It may also be caused by fibroid changes due to arterio-sclerosis and chronic nephritis.

Symptoms.—The symptoms of mitral stenosis are essentially the same as those of mitral insufficiency. Arterial anemia and venous congestions take place with the consequent phenomena. The pulmonary system is first affected, and later, when failure of the right ventricle occurs, the systemic veins are involved.

The symptoms of pulmonary congestion are much more prominent in stenosis than in insufficiency. Edema of the lungs may occur and true hemoptysis takes place from time to time. General anasarca seldom occurs, but ascites and other evidences of portal congestion are present.

Physical Signs.—*Inspection* reveals little that is abnormal unless there be an enlarged right ventricle, or an associated hypertrophy of the left ventricle. In such an event the apex beat is somewhat displaced, and an undulatory impulse is observed over the left auricle, and in children the lower sternum and the fifth and sixth left costal cartilages are often prominent. Frequently a visible pulsation is present in the

second left intercostal space, and sometimes in the third and fourth; after compensation fails, the impulse is feeble, and there is a marked systolic regurgitation in the jugular veins.

Physical Signs.—*Palpation.*—The cardiac impulse is usually most prominent in the region of the xiphoid appendix, and is for the most part diffused, feeble and irregular in character. A presystolic thrill is felt in most cases just above and within the apex. This is of a vibratory or "cat's purr" character, and often terminates with a sudden, sharp shock, synchronous with the cardiac impulse. It is sometimes absent before compensation fails, and oftener after that event. It may sometimes be made appreciable by exercise, or by lying on the left side with the arms elevated. When present, it is pathognomonic of mitral stenosis, but should not be mistaken for a diastolic thrill heard at the base in aortic incompetency. The radial pulse becomes small, irregular and easily compressed as the right ventricle loses its propulsive power.

Percussion shows an increase of dullness to the right of the sternum, about two inches beyond the sternal margin, due to hypertrophy of the right ventricle. There may also be an increased area of dullness on the left of the sternum.

Auscultation.—The murmur of mitral stenosis is heard just above, and about one inch within, the normal apex beat, and is not widely transmitted. It is presystolic, or, rather, auricular systolic, being presystolic only as regards the ventricle systole. The sound is rough, rolling or churning in character, and may terminate abruptly with the first sound, which is unusually clear and snappy, or there may be a distinct interval between the sounds.

The character of this murmur may vary greatly in exceptional cases. It may be short and low toned. It may be quite audible at times, and then temporarily, or permanently disappear. It may lose its characteristic sudden termination. Even if these atypical conditions appear, the accentuated first sound is usually retained.

In cases where compensation is re-established, the murmur also usually reappears. In some cases, the murmur consumes most of the diastole, but more often it is heard only during the latter half of it. The second pulmonary sound is sharply accentuated, on account of hypertrophy of the right ventricle, and the second aortic sound is feeble or entirely absent.

Diagnosis.—The chief diagnostic points are the localized presystolic murmur at the apex, of a churning character, and terminating abruptly in a sudden snap; the accentuated second pulmonary sound, and the physical signs of hypertrophy of the right ventricle.

Prognosis.—The prognosis depends upon the duration of the

hypertrophy of the right ventricle. Under favorable circumstances, the individual may lead a long and comparatively active life, often presenting no symptoms whatever, even though the physical signs of mitral stenosis are distinct. After compensation fails, the history of the case is identical with that of mitral insufficiency.

Aortic Incompetency.

Synonyms.—Aortic Insufficiency, Aortic Regurgitation.

Definition.—A failure of the aortic valves to prevent a regurgitation of blood into the ventricle. It is next in frequency to mitral insufficiency.

Pathology.—“The aortic orifice may be enlarged (relative insufficiency), and here the normal cusps fail to effect complete closure of the orifice. The flaps of the diseased aortic valves sometimes adhere to the intima of the aorta, and laceration of the semilunar segments, which are the seat of diseased processes (particularly ulceration), is sometimes found *post-mortem*, and may be the chief factor in determining the development of the condition. This accident may very rarely occur as a result of a severe straining effort in the case of valves previously healthy. Occasionally, also, the chief factor in the production of this valvular lesion is a congenital malformation of the segments, whereby they are rendered very prone to chronic endocarditis, in consequence of the undue strain to which they are subjected. The lesions that give rise to stenosis may coexist with simple aortic incompetency, and, though the latter condition frequently occurs alone, stenosis is quite as often combined with regurgitation.” (Anders.)

Etiology.—Aortic incompetency occurs more frequently in males than females, and most often during advanced middle life, affecting chiefly strong, able-bodied men, for the reason that the latter are more liable to be engaged in occupations contributing to the etiology of the disease. In some instances aortic incompetency is due to congenital malformation. Acute endocarditis is a common cause, though aortic incompetency does not come on during an attack, unless there be an erosion or ulceration of the valve. For this reason it is more often seen in malignant endocarditis. Imperfect resolution may be followed by a gradual shrinking, contraction and calcification of the valve resulting in incompetency. The disease may be induced by the rupture of a valve segment, either from endocardial strain in a valve weakened by ulcerative changes, or, rarely, from excessive strain, such as heavy lifting. By far the most frequent cause, according to Osler, is the slow contraction due to atheroma, seen in able-bodied laborers who are subject to heavy muscular labors, and who overindulge in alcohol. Alcohol is in itself an important etiological factor. There may be a

syphilitic element which of itself is capable of causing arterial sclerosis. Occurring as the result of atheroma, there are apt to be found associated lesions in the aorta, arteries, kidneys, liver and lungs. The presence of uric acid in the blood may give rise to interstitial endocarditis and arterial sclerosis, especially in gouty subjects. Relative incompetence may, in rare cases, be due to a stretching of the aortic ring where there is an extensive atheroma of the aorta, resulting in great dilatation just above the valves.

Symptoms.—So long as the hypertrophy of the left ventricle makes up for, and equalizes, the valvular defect, there are no characteristic symptoms. In those of advanced years compensation fails much earlier than in younger subjects. When atheromatous changes become extensive, there are usually developed symptoms of arterial anemia—pallor, headache, dizziness, flashes of light before the eyes, faintness even to the point of syncope, palpitation and dyspnea. The dizziness is sometimes distressing, and is always worse when rising from a recumbent posture. The pulse is characteristic; it is quick, jerking and full, but, upon striking the finger, recedes abruptly, and is known as the *Corrigan* or *water-hammer pulse*. This is most decided when the arm is held in a vertical position. Precordial pain is usually present. It may be a sense of constriction in the cardiac region, or sharp, shooting pains extending to the arms—angina pectoris. If at any time the diastole be unduly prolonged, the regurgitating blood may so empty the aorta and large vessels, as to cause sudden cerebral anemia. Sudden death may occur under these circumstances, and its possibility must always be considered in making the prognosis. Edema of the feet, and dyspnea with progressive symptoms of venous congestion, usher in a fatal issue, and differ in no essential features from the venous congestions and heart failure of other valvular lesions.

Physical Signs.—*Inspection* shows a wide and forcible cardiac impulse, with the apex beat displaced downward, showing in the sixth or seventh interspace and to the left. *Percussion* shows an increased area of cardiac dullness both transversely and vertically, chiefly to the left and downwards. The area of dullness is greater than in any other valvular lesion. *Auscultation* reveals a diastolic murmur—a churning, rushing, or, more often, a soft, long-drawn blowing sound of a low pitch. This is the most characteristic and reliable of all cardiac murmurs. It is caused by the reflux of blood from the aorta into the ventricle. It is distinct at the second right interspace, but most distinct at the juncture of the sternum and the fourth left interspace, and is transmitted downward toward and below the apex. It is often heard

better with the ear than with the stethoscope. In most advanced cases there is a relative mitral incompetency giving rise to a soft systolic murmur, usually heard at the apex. A second murmur at the apex, occurring occasionally, is rolling in character, and generally presystolic in time. According to Flint, this is caused by the presence of excessive dilatation of the left ventricle, in consequence of which the mitral leaflets must remain free in the blood stream during the diastole, and here they set up vortiginous movements.

Diagnosis. — Aortic incompetency is the most easily recognized of all valvular lesions. The diagnosis depends upon the presence of a diastolic murmur, hypertrophy of the left ventricle and the Corrigan pulse.

Prognosis. — This is the one valvular disease most liable to occasion sudden death, yet the one which, on the whole, affords the most favorable prognosis. So long as the compensating hypertrophy of the left ventricle is kept up, the patient may suffer no inconvenience and lead an active life, and this may be for many years. After compensation fails, the disease is less hopeful than in mitral incompetency, the restoration of compensation being more difficult and rarely accomplished. Cases occurring in alcoholics with degenerative changes, and frequently renal and arterial lesions offer a hopeless prognosis. Sudden death may result from acute cerebral anemia, due to a blocking of one of the branches of the coronary artery.

Aortic Stenosis.

Definition. — A narrowing or stricture of the aortic orifice. Aortic stenosis is much less common than insufficiency. It soon causes incompetency, so that the two usually coexist.

Pathology and Etiology. — Aortic stenosis is caused by the projection of the valves inward, and their becoming rigid and thickened, or atheromatous and calcareous, so that they can not be pressed back by the blood, but remain constantly in the current of the circulation. The lesion may result from endocarditis, but is nearly always a result of a general process of arterial sclerosis, and therefore occurs most often in men of advanced years, they being most prone to atheromatous changes. In some instances there is a tongue of fibrin or large fibrinous vegetations more or less completely closing the orifice, or the segments may be adherent by their lateral surfaces, leaving a central opening, which may be so contracted as to permit the passage of only the smallest probe.

Symptoms. — There are no symptoms characteristic of aortic stenosis. No symptoms whatever are manifest until compensation

fails, which may not be for many years. In advanced cases there occurs a secondary dilatation of the left ventricle which prevents it from pumping a sufficient amount of blood into the aorta. Thus the supply of blood to the brain is insufficient, and hence attacks of vertigo, syncope, or slight epileptiform seizures occur. In more advanced cases there may be a Cheyne-Stokes breathing during the latter part of the disease. When compensation fails, the symptoms of pulmonary and systemic congestion do not differ in any way from those caused by other valvular affections.

Physical Signs.—*Inspection.*—The cardiac impulse may be feeble, diminished in area, and particularly with emphysema, may be entirely absent. The apex beat is often displaced downward and outward, and the impulse looks strong and forcible.

Palpation reveals a slow, heaving, forcible impulse, unless concealed by emphysema. In many cases a marked systolic thrill is felt at the base of the heart. The pulse is small in size, is regular in rhythm, and may be somewhat slow.

Percussion.—The cardiac dullness is increased vertically, the transverse dullness being slightly affected. The extent of the dull area depends largely upon the extent of the emphysema, if any be present.

Auscultation.—The characteristic murmur is systolic. It is harsh and rasping, sometimes musical, and is most intense at the second right interspace near the sternum and is transmitted along the vessels. It may often be heard a short distance from the patient. This murmur is not pathognomonic of aortic stenosis but may be caused as well by simple roughening of the aortic valve or of the intima of the aorta above the valve, or by anemia. If due to stenosis, the murmur is frequently harsher than if due to the other causes, but even then it may become faint and distant if the left ventricle begins to fail. The second sound is faint or inaudible on account of the diminished blood tension in the aorta and the character of the valvular lesion. When aortic incompetency is present a double murmur occurs, having its greatest intensity at the base of the heart, the so-called to-and-fro, or see-saw murmur. These are the ordinary physical signs of hypertrophy of the left ventricle, and, in the later stages of its dilatation when associated with the enlargement of the right heart from hypertrophy or dilatation.

Diagnosis.—The diagnosis is usually easy, particularly if the patient be an old man. The systolic thrill most intense at the base; the rough systolic murmur most intense in the aortic region and transmitted to the carotids; a tense, slow pulse, and signs of hyper-

trophy of the left ventricle are the chief diagnostic points. The intensity and harshness of the murmur is sufficient to differentiate from anemic murmurs, and from the systolic murmur of aortic incompetency.

Prognosis.—In uncomplicated cases the prognosis is good; compensation being easily maintained by hypertrophy of the left ventricle. If aortic incompetency be present, the prognosis will depend upon that condition.

Tricuspid Incompetency.

Synonyms.—Tricuspid Regurgitation, Tricuspid Insufficiency.

Definition.—An imperfect closure of the tricuspid valve.

Pathology and Etiology.—This condition rarely occurs as a primary disease. It may result from endocarditis, especially in the malignant form. It is most common during childhood, growing less frequent as age advances. Later in life it may result from chronic disease of the lungs or of the left heart, the consequent increased tension in the right ventricle producing chronic interstitial changes in the tricuspid segments. Relative insufficiency is of comparatively frequent occurrence, being due to dilatation of the right ventricle with stretching of the tricuspid ring, or to poor muscular contraction of the ventricle. It is thus produced by a failing left heart, and by any cause producing obstruction in the pulmonary circulation, such as emphysema and interstitial pneumonia. In either case it is a consequence of failure in compensation of the right ventricle. When tricuspid leakage occurs, there is with every systole of the right ventricle, a reflux of blood into the auricle and veins, resulting in venous congestions. There is also a consequent diminished blood supply to the pulmonary arteries. The efforts of the right ventricle to maintain the pulmonary circulation finally result in its dilatation with a corresponding thinning of its walls, until it acquires enormous dimensions.

Symptoms.—There are no characteristic subjective symptoms. In addition to the symptoms of the disease with which tricuspid incompetency is associated, there is present venous stasis with its various consequences, especially pulsation of the jugulars, synchronous with the cardiac movement, and, finally, general venous pulsation, especially of the liver, pulmonary congestion, engorgement of the kidneys, and dropsy.

Physical Signs.—*Inspection* reveals an enlargement and pulsation of the jugular veins, synchronous with the cardiac beats and uninfluenced by respiration. It is more marked on the right side, and is best seen when the patient is in the semirecumbent posture. There is also

a venous pulsation in the superficial veins of the neck, frequently a pulsation of the liver, and evidences of general venous congestions.

Palpation shows an extended but feeble cardiac impulse. Bimanual palpation will reveal a hepatic pulsation synchronous with the ventricular systole. This should not be confounded with the apparent pulsation imparted to the liver by an overacting right ventricle.

Percussion.—Usually there is dullness extending far to the right and below the sternum, but the area of dullness depends largely upon the associated conditions.

Auscultation.—There is almost constantly heard a systolic murmur, usually short, low, and soft, heard with maximum intensity at the lower part of the sternum, and transmitted to the right, frequently as far as to the axilla. There is usually associated a mitral systolic or other murmur due to the accompanying lesions.

Diagnosis.—The chief points of diagnosis are the pulsating jugulars and the hepatic pulsation. When associated with mitral incompetency, the murmur of the latter frequently overshadows that of the tricuspid, which is less pronounced.

Tricuspid Stenosis.

This is one of the rarest of valvular diseases. It may in rare instances be due to congenital malformation, but is usually secondary to endocarditis, and associated with lesions of the left heart, especially mitral stenosis, the pathological changes being similar to those of the latter. Effectual compensation can not occur, as it depends upon the right auricle, which, already weak, soon becomes dilated. This is rapidly followed by venous congestions and cyanosis, associated with venous pulsations similar to those described when speaking of tricuspid incompetency.

Pulmonary Incompetency.

Synonyms.—Pulmonary Regurgitation, Pulmonary Insufficiency.

This condition is exceedingly rare, and is almost invariably due to congenital malformation. It may follow acute malignant or chronic endocarditis after birth. The blood regurgitates backward into the right ventricle, resulting in hypertrophy and dilatation, relative incompetency of the tricuspid valve often resulting. As a rule the changes correspond closely to those of aortic incompetency. There is a diastolic murmur, but it can not be distinguished from that of aortic regurgitation. Compensation can not be perfectly maintained and a fatal issue occurs in a comparatively short time.

Pulmonary Stenosis.

This condition rarely exists except as a congenital malformation, being often associated with an open foramen ovale or an imperfect inter-ventricular septum. It may result from malignant endocarditis. The valve segments are usually united, leaving a small, narrow orifice. Compensation is brought about by a hypertrophy of the right ventricle, but it is seldom perfect, and is easily upset by intercurrent pulmonary diseases. Dilatation of the right ventricle and tricuspid incompetency usually result.

Physical Signs.—There may be heard a systolic murmur with a thrill in the second left interspace, the second pulmonary sound is feeble or absent, there is hypertrophy and dilatation of the right ventricle, and there may be the murmur of tricuspid incompetency, with fullness of the superficial veins, especially of the neck. Sansom holds that disease of the pulmonary artery (contrary to other forms of organic heart disease) predisposes markedly to pulmonary tuberculosis.

Prognosis.—The duration of the disease is usually short, death generally occurring in from a few days to a few months.

Combined Valvular Lesions.

“These are extremely common. The mitral and aortic segments may be affected together; next in frequency comes the combination of mitral and tricuspid lesions; and then of aortic, mitral and tricuspid. Aortic insufficiency or aortic stenosis is more frequently combined with mitral incompetency than aortic stenosis with mitral stenosis, or mitral stenosis with aortic insufficiency. In children the most common combination is aortic and mitral insufficiency. In adults, mitral insufficiency with thickening of the aortic valves and slight narrowing is perhaps the most common.” (Osler.)

Treatment of Valvular Disease.

The prophylaxis of valvular disease is often of great importance. When we consider that these affections are in the main due to rheumatic endocarditis, it is evident that the nearer we can come to bringing about perfect resolution in that disease, the less liable we are to have chronic lesions remaining. According to the statistics of Gibson, complete rest and protection of the surface during an attack of acute articular rheumatism lessen the average percentage of cases in which acute endocarditis develops. In case symptoms of the latter become manifest during an attack of acute rheumatism, the patient should not be allowed to leave his bed until two or three weeks after all rheumatic

and cardiac symptoms have disappeared. Those predisposed to heart disease from any cause should always be impressed with the fact that undue exposure, alcoholic liquors, muscular strain, mental excitement and irregular habits all favor the aggravation of pre-existing tendencies. The patient should be encouraged to lead a quiet, systematic, well-regulated life. He should wear woolen next the body the year round, avoid exposure to cold and dampness, eat simple and wholesome food, avoid tobacco, tea, coffee, and all stimulants, or any food or drink that favors an acid diathesis. Mental worry, overfatigue, and especially fast walking, running, climbing and lifting must be avoided. At the same time a sedentary life is undesirable. Moderate exercise and plenty of open air and sunshine are essential. Daily sponge baths, followed by friction of the surface are to be recommended. Often removal to a warm climate of moderate altitude, during the winter months, is of great benefit.

The treatment of valvular disease during the stage of compensation requires the same hygienic measures as are employed when valvular disease is only anticipated or suspected. The work thrown on the heart should be lessened as much as possible, as while the compensating hypertrophy is an absolute necessity, every effort must be made to prevent overaction of the heart and consequent weakness and dilatation. The hygienic measures already mentioned will aid in this purpose. Systematic, graduated exercise will often develop the compensating power of the heart without causing weakness. Oertel recommends ascending hills of increasing steepness and length, until compensation is fully established. At no time, however, should exercise or work ever be allowed to pass to the point of excessive fatigue, nor should sudden violent exercise be permitted. At the same time I agree with Goodno, who aptly says: "It may be stated as an axiom that the patient suffering from valvular heart disease must bring down the level of his life activities to that of his heart's capability."

"Persons under the necessity of working for a living will do better to continue such work, unless too laborious and overtaxing to the heart's energy, than to live a life of inactivity. Inactivity of its muscular system tends to produce weakness of the heart and to form fatty degeneration, thus tending to the production of dilatation rather than the desired hypertrophy." (Hale.) Fright, worry and excitement must be avoided. Amusements are desirable, but even pleasure carried to the point of excitement is injurious. A tranquillity of mind is of great importance. Patients suffering with plethora, or, as is unfortunately much more often the case, with anemia, should receive the proper hygienic and dietetic treatment for the same. As to the character of food required, Anders says: "Only a very moderate

amount of food, composed for the most part of readily digested albuminous articles (milk, eggs, the lighter forms of meats, and stewed fruits), is to be taken, since overloading the stomach will disturb the action of the heart; particularly is this true at night. The carbohydrates may be allowed only in limited quantities, since they are apt to decompose, and form gases that distend the stomach and intestines. For the same reason the coarser and more indigestible food-stuffs should be avoided. Small meals at short intervals is a plan of feeding that I can highly commend. The amount of liquids taken should not exceed the actual requirements of the patient, inasmuch as overfilling of the blood-vessel system increases the work of the already overburdened cardiac forces. Alcoholic beverages should not be used as a rule; but if the patient has been moderate in the use of alcohol, and particularly if he be advanced in years, light wines may be allowed in moderate quantity to aid digestion."

Even *after the signs of failing compensation* are manifest, the same general principles of hygienic treatment somewhat modified by existing circumstances are equally applicable. The prominent exception is that at this stage of the disease absolute rest in bed and perfect quiet are essential. In mild cases it may only be necessary to confine the patient to his room. By observing this important rule, disturbed compensation may sometimes be overcome without medicinal aid.

The medicinal treatment of valvular disease may be advantageously divided into (1) During the stage of compensation, and (2) During the stage of failing compensation.

1. *Stage of Compensation.*—The chief object here is to keep the patient in as good health as possible, and to this end the observance of proper hygienic and dietetic rules is of far more importance than medicines, though any symptoms of disturbed function of whatever character should at once be met with the indicated remedy. Goodno very wisely suggests that "there is too great a tendency to medicate patients suffering from valvular disease of the heart, but medicinal agents should be employed only for the control of such symptoms as may be unrelieved by careful employment of physiological methods."

Hale recommends the administration of drugs that favor compensating hypertrophy. I do not believe it wise to attempt any artificial aid to compensation before the signs of failing compensation makes such a course necessary. Certainly one of the most reprehensible methods of practice, and one which extensively prevails, is the indiscriminate use of *Digitalis* during the stage of compensation. It is a great question if *Digitalis* is ever indicated or useful. Its pathogenesis plainly shows that the indications for its use only begin when the signs

and symptoms of cardiac weakness become manifest. From a physiological standpoint, *Digitalis* is a heart tonic, and given in material doses in this stage it will surely produce excessive heart action, and thus cause hypertrophy to progress too rapidly, with the certain result of bringing about early weakness, dilatation and total failure of compensation. Hale also advises the employment of remedies to prevent hypertrophy progressing too rapidly, and for this purpose suggests *Verat. vir.*, *Coca*, *Cactus*, *Lycopus*, *Kali brom.*, *Aurum*, and *Glonoine*. If used they should be prescribed with great care and only when indicated. If there is an abnormal force and frequency of the heart's action, incompatible with the necessities of compensation, *Verat. vir.* is the remedy most often indicated, and its effects even in small doses (1x or 2x dilution) is often marvelous.

Glonoine (3x), is especially useful in such cases, due to aortic lesion, and is often markedly beneficial.

Lycopus (Tincture) has proved of great value in my hands. It will calm the action of the heart without leaving injurious effects. According to Hale, "When the rapidly progressing hypertrophy results in causing pulmonary hemorrhage, this remedy is doubly indicated."

Cactus (2x), may be successfully used in too rapid hypertrophy where the heart's action is relatively too forcible for the valvular lesion, but only when its well-known characteristic symptoms are present, especially the sensation of an iron band constricting the heart and preventing its normal movement.

2. *Stage of Failing Compensation.* — In this stage any successful medicinal treatment must, in a great measure at least, be based upon physiological and mechanical principles. The overworked heart muscle is giving out and needs help, without which dilatation and total failure of compensation with its ultimately fatal consequences are sure to ensue. Even here absolute rest and quiet are often worth more than medicine, but in most cases a cardiac tonic is required. In other words, medicines are needed that possess the power to increase the strength of the heart's contractions, at the same time modifying their frequency and regulating their rhythm. In selecting such a medicine, careful discrimination must be observed, and the symptoms and general indications carefully noted. So far as our provings go, there can be no safer guide for the selection of a cardiac remedy, but unfortunately the number of such remedies well proven according to our present knowledge of cardiac diseases, is very few, and the necessity of depending upon inferences based upon our knowledge of the physiological effects of a drug is often required. Hale says we should remember "that heart failure, overdilatation, etc., are all secondary, and that the secondary effects of all cardiac

tonics simulate secondary valvular troubles." Frequently it is possible to lop off a distressing symptom by giving the remedy covering that symptom, and thus afford the patient material relief, but the failing heart continues to fail just the same, unless that remedy also possesses a specific action upon the heart muscle. This is notably true in my experience with Aconite and to a somewhat less extent with Arsenicum. These remedies often afford marked relief for certain symptoms arising in the course of valvular disease, but they have no power whatever in preventing dilatation and cardiac weakness. The same is true of many other remedies that may be indicated from time to time, and which may prove valuable as palliatives, but can go no farther.

Digitalis stands deservedly at the head of the list after signs of failing compensation are manifest. It is far more frequently indicated both from a symptomatic and a physiological standpoint than any other remedy, and is proportionately useful. Among its characteristic symptoms we find dyspnea with anxiety. Heart's action feeble; beats more frequent and intermittent; sometimes irregular. Thready, slow, intermittent pulse; irregular; small. Pulse weak and jerky, on slowly sitting up after reclining in a chair. This certainly presents an accurate picture of a failing heart. Hale says: "Its primary action upon the healthy heart is to slightly quicken the number of beats, but only for a short time, when its real tonic action begins. The contractions of the ventricles become stronger, increase in force, and become slower, even to 30 or 40 per minute. Up to this time its action is physiological and harmless, but soon the contractions become intermittent, and then irregular, but still very slow; the arteries are filled to their fullest capacity, and the blood in the veins returns with force to the heart. If the drug is continued, the contractions become less complete, because the cardiac muscle is becoming tetanized, and soon the heart closes firmly with a permanent tetanic spasm, which relaxes no more, and death ends the scene. But, if the drug action stops just short of tetanic closure, the symptoms come on in reverse order. An utter relaxation of the cardiac muscle follows, the ventricles become distended, beat irregularly, intermittently, sometimes slow, then rapid; the arteries are not filled, and there is venous stagnation. Its secondary effects are therefore similar to the secondary effects of valvular lesions, namely; distention, dilatation, and non-compensation. When we use Digitalis in such lesions, we are using it homœopathically, *not* its *primary* homœopathicity, but its *secondary*. It can not be called *antipathic* to such conditions. By using it in physiological doses, we need not induce its ultimate toxic effects, but carry its action up to the establishment of normal physiological action."

Goodno says: "The favorable influence of Digitalis in failing compensation, when given in moderate doses of the tincture, is so positive that only a lack of experience or prejudice can generate opposition to its use. As in the case of all valuable medicines, it is greatly abused, bad results arising largely from unwise increase of dose to meet cases not relieved by the ordinary quantities prescribed." I use in preference about five-drop doses of the 1x dil., increasing, if required, to from one to three-drop doses of the mother tincture, but seldom go beyond that. In some cases a somewhat larger dose of the infusion serves a better purpose.

Convallaria.— This drug is usually placed next to Digitalis in its efficiency. Its range is not so wide, but it often acts promptly in cases where Digitalis is not giving satisfaction. Contrary to Digitalis it acts best when the right heart is diseased. "This gives Convallaria greater power over pulmonary congestions, dyspnea and orthopnea. In fact its most brilliant results have been in those terrible dyspneas which occur in valvular disease of the right heart." "Clinically it has been found useful in all conditions of the heart, due to valvular stenosis or insufficiency, when the ventricles are suffering from overdistention, and dilatation begins; when there is incompleteness or absence of compensation, and the system suffers from deficient arterial blood supply, and when there is venous stagnation."

"In women with functional or structural diseases of the heart, with great nervous irritability, horrible dreams, hysterical manifestations, Convallaria gives more relief than any other drug. Its power in removing *dropsy* due to cardiac disease is sometimes marvelous, but always in proportion to its restorative power over the failing heart." (Hale.) The usual dose is from one to ten drops of the tincture made from the fresh flowers, repeated every two to four hours according to necessity.

Caffeine.— This drug is being extensively used at the present time, especially in extreme cases and when Digitalis and other indicated remedies are of no avail. The citrated is especially valuable in cases secondary to kidney disease. In urgent cases of threatened heart failure Caffeine may be administered hypodermatically and often with marvelous effect. I generally employ the 1x trituration tablets, giving one at a dose from five minutes to two hours apart, according to the urgency of the case. It will often at the same time calm and strengthen the heart's action and afford the patient marked relief.

Strophanthus.— I have used this remedy with some success where Digitalis has failed to act satisfactorily, but I find it most often useful in cases secondary to Bright's disease. Goodno has found it

especially useful in cases of failing heart, due to cardio-vascular sclerosis, usually associated with an interstitial nephritis. He says: "In valvular affections, with an excess of pale urine, it has sometimes appeared to modify favorably the entire symptom group, even in the lower dilutions." In controlling the irregularity or intermittency of cardiac action, it is sometimes better in its influence than *Digitalis*. I generally give drop doses of the tincture or prescribe the 1x dilution in the usual manner.

Cratægus.—This drug has received considerable attention of late, and has been highly lauded for cardiac disease. It has a somewhat similar action to *strophanthus* and undoubtedly possesses the power to slow and strengthen the heart's action. Even after dropsy is present, *Cratægus* will strengthen the failing heart and reduce the dropsy. Dr. Halbert says "it is also useful when there is dilatation with extreme dyspnea. It has a powerful action upon the pneumogastric, correcting its inhibitory function when cardiac failure exists as a result of too much sympathetic stimulation." The usual dose is from three to five drops of the tincture three or four times a day, but it is probable that the first decimal dilution will give equally good and more lasting results.

Glonoin is supposed to be particularly useful in aortic disease. This inference is reasonable when we note the condition of the cerebral and pulmonary circulation present in aortic disease, and the general high arterial tension, so similar to the effects of nitro-glycerine. The old school recognize its usefulness, and prescribe it in very small doses as "a cardiac stimulant and arterial relaxant." I generally employ the 2x dil. or granules $\frac{1}{100}$ gr.

Strychnia.—The unquestionably powerful influence of strychnia in arresting a threatening heart failure from paralysis is universally recognized, and has led to its frequent indiscriminate use in heroic and unnecessarily large doses. It is especially useful in the later stages of dilatation. I generally employ the 2x trit. tablets, giving one from 3 to 6 hours apart, according to the urgency of the case. In cases of sudden failure of heart power it may be given in much larger doses hypodermatically. The old school consider strychnia "the most efficient cardiac stimulant known to medical science."

Agaricin.—Goodno speaks highly of this remedy, but it is not extensively employed. He places it in the front rank as a cardiac stimulant. He says: "Its range is more limited than that of *Digitalis*. In two or three cases of extreme dilatation of the right heart, secondary to mitral disease or emphysema of the lungs, *Digitalis* and other well-known stimulants having failed, and a fatal result appearing imminent, two- or three-grain doses of the first decimal trituration of agaricine, repeated every one to three hours, gave not only temporary relief, but

in two instances protracted the patients' lives and conferred much comfort. As a remedy in cardio-plegia it can hardly be excelled, not even by strychnia. The indication which first led to the use of agaricine in these cases was troublesome coexisting sweating."

Sparteïn is especially useful in cases complicated with nephritis and where dropsy is an important feature. In those cases of nervous origin, often hysterical, when the general conditions simulate cardiac failure, but without the presence of murmurs or other distinctive signs of organic disease of the heart, Sparteïn has proved a wonderfully efficient remedy. I always use the Sparteïn sulphate 1x trit. tablets, giving one or two tablets from two to six hours apart.

There are many other remedies, the physiological indications for which might be noted, but whose effects have not been sufficiently tested. Well-indicated homœopathic remedies should be prescribed at all times regardless of physiological conditions, but only those will criticize the use of cardiac stimulants under certain conditions who have had no practical experience in the treatment of valvular disease.

BAD NAUHEIM TREATMENT.

The Bad Nauheim, or Schott treatment of chronic heart diseases, has received considerable attention from the profession of late, and has apparently given markedly beneficial results, especially in dilatation. It consists in a series of saline and effervescent baths conjoined with passive exercise, in the use of which great care and attention to details is required. It is used in cases of dilatation, either primary or secondary. Also in fatty degeneration, myocarditis, angina pectoris, Graves's disease, tachycardia and for the remains of old effusions and products of inflammation. It is contraindicated in aneurysm, Bright's disease and arterio-sclerosis.

Dr. Gatchell, in his Pocket-Book of Medical Practice, gives the following condensed description of this method of treatment, which I am permitted to quote in full:—

SALINE BATHS.

(First Series.)

First Baths.—Water, 40 or 50 gallons; Sodium chloride, 5 lbs.; Calcium chloride, $\frac{1}{2}$ lb. In the series of 20 baths the Sodium chloride is to be gradually increased to 10 lbs., and the Calcium-chloride to 1 lb.

Temperature.—First bath, 92° F. After each series of three baths, lower by 1 degree, but in the end do not let the temperature go below 83°.

Duration.—In the first bath let the patient remain 5 to 8 minutes. In each successive bath increase by 1 minute, until a limit of 20 minutes is reached, with which duration they may be continued.

Precautions.—The physician should supervise the giving of the first few baths. In the bath, guard against syncope. If the patient suffer from chill, take him at once from the bath. If the bath chills, give the next bath of a higher temperature. In the bath the patient must remain absolutely motionless. Never give a bath soon after eating.

After the Bath.—On coming from the bath, do not let the patient stand. Place him recumbent on a bed or couch, and dry him off. Then, in a warm bed, let him sleep for an hour or two.

Number of Baths.—Give three baths on three successive days; then wait one day, and give three more. Continue in this way until 20 or 25 baths are given.

EFFERVESCENT BATHS.

(Second Series.)

Prepare the bath with Sodium chloride and Calcium chloride, as for the saline bath. Add Sodium bicarb., and HCl. Begin with a *mild* bath, and gradually increase to the *strong*.

Mild.—Sodium bicarb., $\frac{1}{2}$ lb.; HCl (25%), $\frac{3}{4}$ lb.

Medium.—Sodium bicarb., 1 lb.; HCl (25%), $1\frac{1}{2}$ lb.

Strong.—Sodium bicarb., 2 lbs.; HCl (25%), 3 lbs.

The Acid.—To add the acid, loosen the stopper of the bottle, invert the bottle with the mouth just below the surface of the water, and withdraw the stopper; move the bottle about so as to diffuse the acid generally over the surface of the water.

Method.—Let the patient remain 5 to 8 minutes. Give 3 baths, wait one day, and give three more. Gradually increase from mild to strong. First bath at 92° F., gradually lower the temperature. When 20 baths have been given in this way, stop for several weeks (1 to 3) and give another series, being guided by the effects produced, and the demands of the case.

NOTE.—No rule is invariable. The time, temperature, strength of bath, periods of rest, etc., must be regulated by the intelligence of the careful physician

Passive Exercise.

Method.—It consists in *resisted movements*, the patient moving a limb, or a part, the operator opposing gentle resistance. The design is to obtain *exercise without fatigue*.

Rules.

Frequency.— Once daily.

Parts.— Extremities; head; trunk.

Motions.— Flexion; extension; adduction; abduction; rotation.

Sequence.— Bring different sets of muscles into action at different times.

Time.— Of séance, 30 to 40 minutes.

Time.— Of single movement, 30 to 40 seconds.

Rest.— Rest an equal period between.

Motion.— Slow and resisted.

Cautions.— Do not grasp a limb; do not compress blood vessels; regulate the resistance to the condition of the patient, watch respiration, pulse, palpitation. Respiration or pulse must not be much quickened. If they are, or if the patient yawns, stop and rest. Proceed again cautiously.

Results.— The Bad Nauheim treatment: The heart is reduced in size; the pulse beats slower and with more force; the arteries are filled; the veins depleted; the urine is increased; dropsy is reduced.

HYPERTROPHY AND DILATATION.

Definition.— Hypertrophy is an enlargement of the heart caused by an increase in its muscular structure, with more or less thickening of its walls. Dilatation consists in an increase in the size of one or more of the cavities of the heart, with or without a thickening of the walls, the latter being frequently thinner than normal. Hypertrophy and dilatation usually coexist, and may be described to advantage under one head.

Varieties.— 1. Simple hypertrophy, or hypertrophy without dilatation. 2. Hypertrophy with dilatation. This form has been described as "eccentric hypertrophy," in contradistinction from "concentric hypertrophy" or, hypertrophy with diminution in the size of the cavities, which is now known to be only a post-mortem condition. 3. Dilatation with thinning of the heart walls. Simple dilatation without either a thickening or thinning of the heart walls probably does not exist. Some authors mention a variety which they term dilatation with hypertrophy, not identical with hypertrophy with dilatation, the difference consisting in that the vigor of the heart walls present in the latter is lost in the former through "the weakening influence of the degenerative processes that attack the hypertrophied muscles." For practical purposes this variety may be eliminated. In all cases, the variety of the lesion is of little consequence compared with its results

in preventing the heart from performing its functions in a normal manner.

General Etiology. — Hypertrophy and dilatation may be caused by any condition which prevents the heart from doing its work. This work consists in (1) contracting on its contents; (2) forcing the blood against resistance; (3) facilitating the flow of the blood current by a perfect condition and action of the valves.

1. *Weakness of the heart muscle* will prevent normal contraction on its contents. The heart may be normally strong and yet not strong enough to perform extra work required of it under extraordinary circumstances, as in sudden and severe overexertion, running, lifting, rowing, etc., or exercising, even moderately, in high altitudes. This is only a comparative weakness. Actual weakness may be present and prevent the heart from normally contracting on its contents under ordinary circumstances. A weak heart may result from poor nutrition, either local or general. Local nutrition suffers when from atheroma of the coronary arteries, there is a deficient supply of blood to the heart muscle. General malnutrition, affecting the whole system, from any cause, may produce a corresponding weakness of the heart muscle. Weakness, impairing the contractile power of the heart, results from chronic degeneration of the heart, either fatty or fibroid; or acute degeneration, as found in acute fevers and infectious diseases. It may result from acute myocarditis, and is frequently caused by rheumatic endocarditis and pericarditis.

2. *Increased resistance to the onward blood current* may induce hypertrophy and dilatation. If this resistance occur in the systemic vessels, it will affect the left side of the heart. If it occur in the pulmonary vessels, it will affect the right heart. When occurring in the systemic circulation, it may be caused (a) by endoarteritis, the lumen being narrowed and the walls of the small arteries non-yielding; (b) by spasm of the small arteries, which may result from endoarteritis, Bright's disease, uric acid diathesis, gout, diabetes, or overeating and excessive use of alcoholic liquors.

When resistance occurs in the pulmonary circulation, it is caused (a) by failure of the left heart, due either to weakness of the heart muscle, dilatation or valvular disease, especially of the mitral valve; (b) by obstruction of the pulmonary vessels from spasm, endoarteritis or obliteration.

3. An imperfect condition and action of the valves may be due (a) to stenosis of any valve, or (b) to insufficiency of any valve. The causes of valvular stenosis and insufficiency have been considered under their respective heads.

Methods of Compensation.—Compensation consists in the development of an increased heart-power made necessary by any demand upon the heart for work greater than that normally required. Compensation takes place in two ways: 1. *By an increase in the force and frequency of the heart's action.* "This is the simplest form of compensation, and is especially adapted to meet sudden demands. The rapid and forcible heart's action after a short run is the best example that can be cited. Compensation by increase of the heart's action is often associated with hypertrophy, and it is most important that this fact be remembered. For example, in aortic regurgitation hypertrophy of the left ventricle is hardly efficient enough by itself to compensate for the diastolic regurgitation of blood. There must also be an increased frequency of ventricular contraction to keep the ventricle emptied of the blood which, during diastole, pours into it not only from the auricle, but backward as well from the aorta, past the inefficient aortic valve. It is poor practice to try to reduce the pulse-rate of such a case to the normal limit of 72 to the minute. If we do, we run the risk of giving the ventricle time enough between contractions to become distended to too great a limit, with disastrous results. "2. *By Hypertrophy.*

Hypertrophy.

"Hypertrophy is an actual increase in the amount of cardiac muscle, giving the heart thereby increased force adequate to the increased demand for force. The condition is purely compensatory and physiological, and is analogous to the enlargement of the biceps of a blacksmith. Certain conditions must be complied with before hypertrophy can occur.

"1. *A certain amount of time* is necessary. Hypertrophy is a slow process, requiring a minimum time of two weeks for its development. Preceding its completion there may be a primary compensation by increased force and frequency of the heart's action. The process of hypertrophy is so slow that patients may die from disturbed circulation before compensation is established.

"2. *The lesion must not be excessive.* It can readily be seen that in very extensive lesions no amount of muscular hypertrophy can restore the circulation to an equilibrium.

"3. *The lesion must not be too rapidly progressive.* A lesion slight at first may be perfectly compensated, but if it progresses, it may become too severe for hypertrophy to keep up with it.

"4. *There must be a healthy condition of the heart muscle.* This is of the utmost importance. Weakness of the heart muscle may

prevent hypertrophy entirely or may only allow a degree of hypertrophy inadequate to the demand, so that compensation occurs but imperfectly. Weakness of the heart muscle may at any time prevent the maintenance of hypertrophy, so that compensation will fail." (Lockwood.)

Etiology.—Hypertrophy of the left ventricle is caused by the following heart lesions: Aortic incompetency or stenosis; mitral incompetency; pericardial adhesions, particularly in the young; and by fibroid myocarditis. Hypertrophy also results from "disturbed innervation, with overaction, as in exophthalmic goiter, in long-continued nervous palpitation, and as a result of the action of certain articles, such as tea, alcohol and tobacco." (Osler.) It is also caused by the following conditions of the blood vessels: General arteriosclerosis, narrowing of the lumen of the aorta, either from congenital stenosis or external pressure; increased arterial tension due to contraction of the smaller arteries from the action of certain toxic irritants, such as lead, Bright's disease, gout or syphilis.

Hypertrophy of the right ventricle, as has already been noted, is caused by any obstruction giving rise to increased resistance in the pulmonary vessels, such as mitral incompetency or stenosis; compression or obliteration from emphysema or cirrhosis; valvular lesions of the right heart, particularly stenosis, or other obstruction of the pulmonary orifice. According to Osler, "chronic valvular disease of the left heart and pericardial adhesions are sooner or later associated with hypertrophy of the right ventricle. In the auricles, simple hypertrophy is never seen; it is always dilatation with hypertrophy. In the left auricle, the condition develops in lesions at the mitral orifice, particularly stenosis. The right auricle hypertrophies when there is greatly increased blood pressure in the lesser circulation, whether due to mitral stenosis or pulmonary lesions. Narrowing of the tricuspid orifice is a less frequent cause."

Pathology.—The entire heart may be involved (general hypertrophy), or only one cavity on each side, or only one side, or but a single cavity, these being each termed partial hypertrophy. In rare instances, only a small subdivision is involved (circumscribed hypertrophy). The left ventricle is oftenest involved, the right ventricle next, and the right auricle more frequently than the left. The weight of the heart may be increased from the normal, about nine ounces in men and eight ounces in women, to even forty or fifty ounces in extreme cases, but rarely above twenty ounces. The thickness of the walls may also be measured, in order to determine the degree of hypertrophy. In the normal heart, the wall of the left ventricle measures

from one third to one half an inch; the right ventricle, from one fifth to one fourth of an inch; the left auricle, about one eighth of an inch; and the right auricle, about one twelfth of an inch. Any increase in thickness of the walls constitutes hypertrophy. The increase usually reaches twice or three times the normal thickness, and sometimes, in rare cases, four times. If there is considerable dilatation, the walls, though thickened, may appear thinner. The shape of the heart is altered by hypertrophy; if the right ventricle, the heart is widened transversely and the apex blunted; if the left ventricle, the heart is elongated and, as a rule, the cavity is dilated; if both ventricles are hypertrophied, the heart has a globular shape. The tissue is firmer and the color brighter and fresher than when the size of the organ is normal.

Symptoms.—In most cases, so long as hypertrophy is compensatory, no subjective symptoms are manifest, the circulatory disturbances and consequent symptoms naturally due to the primary lesion being prevented by the equilibrium maintained by the protective compensation. It is thus, as Osler states, "in almost all cases an unmixed good; the symptoms which arise are usually to be attributed to its failure, or, as we say, to disturbance of compensation." As soon as failure of compensation begins, with incipient dilatation, both local and general symptoms become gradually manifest. The patient may complain of a sensation of discomfort and fullness in the chest, which is worse in the recumbent posture, and when lying on the left side. Except in neurasthenics, and in cases due to tobacco or excessive muscular exertion, there seldom is pain or palpitation, though the patient can feel the pulsations of the heart. Any excitement, mental emotion, active exercise or excessive eating will cause a decided aggravation. There may also be headache, epistaxis, tinnitus aurium, dyspnea on exertion, flushing of the face, flashes of light before the eyes, dry cough and restless nights. Especially in those cases due to increased resistance in the arteries there results, in long-continued cases of hypertrophy, endoarteritis and arterio-sclerosis. As a consequence of too forcible circulation, rupture of the sclerotic vessels may occur. This is most apt to occur in the lungs near the heart (pulmonary apoplexy), or in the brain (apoplexy).

Physical Signs.—*Hypertrophy of Left Side.*—*Inspection* may show, especially in women and children, a fullness or prominence of the precordium, with a distinct visible impulse over an increased area, the apex beat being displaced downward and outward.

Palpation.—In simple hypertrophy there is a slow, heaving, systolic impulse, felt as low down as the seventh or eighth interspace, and two or three inches to the left of the nipple. The impulse is so forcible as to distinctly raise the fingers of the examiner. If dilatation is also

present, the forcible impulse is more abrupt and sudden. If the impulse is continuously strong and heaving, it shows the heart muscle to be in a healthy condition. A weaker diastolic impulse is sometimes felt over the aortic orifice. In simple hypertrophy the pulse is strong and regular, and of high tension. With associated dilatation it is full, but soft and somewhat accelerated. An irregular and intermittent pulse is one of the earliest signs of failing compensation and dilatation.

Percussion.—The area of cardiac dullness is increased vertically and transversely upon the left side of the sternum, unless the right ventricle is also hypertrophied, when the cardiac dullness is also increased to the right of the sternum. In moderate cases the left limit of dullness corresponds closely to the area of impulse, but where the hypertrophy is extensive, the systolic impulse reaches far beyond the area of dullness.

Auscultation.—In simple hypertrophy without valvular lesions, there may be no change in the sounds of the heart, or, the first sound at the apex may be loud, prolonged and of a booming or metallic quality, and the second sound strongly accentuated, being loud, clear and snappy. The latter is most distinct in those cases consequent upon increased arterial resistance. Reduplication of the second sound is common in cases due to kidney disease. In cases consequent upon valvular lesions the above sounds are modified and more or less replaced or associated with murmurs.

Hypertrophy of the Right Side.—Hypertrophy of the right ventricle usually results from increased resistance in the pulmonary circulation. So long as perfect compensation is maintained, there are no symptoms or physical signs, and this may last for a long time, even for many years, this form being the most enduring and salutary of all cardiac lesions. As hypertrophy of the right ventricle is commonly associated with mitral disease, especially mitral stenosis, the physical signs of mitral affections should be carefully considered.

Inspection usually reveals a bulging of the lower part of the sternum and left cartilages, and below the ensiform cartilage there is a visible epigastric pulsation caused by the enlargement downward of the hypertrophied right ventricle. A visible impulse is quite common in the sixth interspace near the left edge of the sternum. Especially in cases with dilatation this impulse is seen in the third and fourth interspaces to the right of the sternum.

Palpation shows a diffuse apex beat, and a distinct heaving impulse just below the ensiform cartilage. The radial pulse is small, and, if there is dilatation, it is frequent, small and irregular.

Percussion.—Cardiac dullness is increased to a point an inch or more to the right of the sternum. A great transverse increase of dullness signifies extensive dilatation.

Auscultation.—The sounds have no marked significance unless there is associated dilatation, when the second sound, heard in the second interspace to the left of the sternum is accentuated. If emphysema be present, this sound may be entirely overshadowed, even though the right ventricle be greatly hypertrophied. In such cases jugular pulsation is present, due to tricuspid incompetency.

Diagnosis.—The diagnosis of hypertrophy of the heart depends very largely upon the physical signs and the presence of the etiological factors already mentioned. If there be extensive emphysema the diagnosis is often impossible, though in such cases jugular pulsation is almost pathognomonic of hypertrophy. A careful study of the physical signs ought to readily differentiate the condition from aneurysm, pericardial effusion, mediastinal growths or displacement of the heart, and should effectually eliminate neurotic palpitation. When an unusual surface of the heart is exposed from the contraction of the left lung due to pleurisy, cirrhosis or phthisis, or, when it occurs, as is sometimes the case, in persons with abnormally narrow chests, the pulsation may appear so extensive and forcible as to lead one to suspect hypertrophy, but the history of the case and the physical signs are sufficient to exclude it. It should be remembered that cirrhosis of the lung sometimes produces hypertrophy of the right heart.

Prognosis.—A moderate grade of hypertrophy may pass unnoticed, and be the means of lengthening rather than shortening life. Even in organic valvular lesions by maintaining a circulatory equilibrium, life is often greatly prolonged. The condition is conservative and protective rather than destructive. The time comes, however, in most cases, when the heart's vigor fails to meet the requirements of the circulation, that is, compensation fails. This may result from many causes, either sudden or gradual, more often the latter, and then follows muscular degeneration and consequent circulatory disturbances due to cardiac weakness and secondary dilatation. If compensation fail suddenly from some severe emotion or undue exertion, acute dilatation may take place, and fatal results rapidly follow. Anders gives the following prognostic points: "*Favorable conditions.*—(1) When the hypertrophic development fully compensates the causal lesion; (2) when the causes are removable or more or less amenable to treatment; (3) when the external conditions under which the patient lives, his habits and general nutrition are good. *Unfavorable.*—(1) When signs of imperfect nutrition of the heart arise; (2) when evidences of advancing cardiac dilatation (dyspnea, rapid, irregular pulse, edema) show themselves; (3) when poverty, poor food, intemperate

habits, and an unhygienic environment are all combined; (4) when apparent cardiac vigor suddenly gives place to dilatation and great cardiac weakness."

Dilatation.

Pathology.—As has already been noted, dilatation may occur either with thickening or with thinning of the heart walls, the former corresponding to hypertrophy with dilatation. Dilatation is reached as soon as the ventricle fails to empty itself during the systole. The right ventricle is dilated oftener than the left. Usually more than one cavity is more or less affected, and in cases of aortic incompetency all the chambers may be dilated. In mitral stenosis the left auricle is often greatly dilated. Of all the chambers the left ventricle is least often dilated. As has already been seen, hypertrophy is a compensatory process, and is conservative and protective. It is an evidence of vigor, and the work of the heart is well done. On the contrary, dilatation is destructive, an evidence of weakness, and the work of the heart is imperfectly performed. Dilatation with hypertrophy is usually secondary to valvular disease, the hypertrophy preceding and compensating. When the compensation fails, dilatation gradually takes place. In other cases when there is a sudden lesion of the heart from overstrain or other cause, dilatation occurs first, and is followed by a compensating hypertrophy. In all instances, dilatation is due to the heart being unable to do the work required of it, whether that be on account of an extra demand from valvular disease or other cause, or because of impaired nutrition of the heart walls, so that the heart is weakened beyond the point of doing its normal work. Under such conditions there is either arterial anemia or venous congestion, and the heart not being able to empty itself there is always some residual blood, which, especially if the heart walls be impaired, increases the size of the cavities and dilates them. When the auricles dilate, the large venous trunks opening into them unprotected by valves commonly participate in the dilatation, and may become greatly enlarged. The shape of the heart is altered, depending on the part affected and the extent of the dilatation. The muscular tissue usually presents evidences of degeneration. The orifices also participate, and especially the auriculo-ventricular, resulting in the valves becoming incompetent to close the orifices, and this latter effect is added to by the removal of the basis of the papillary muscles a greater distance from the orifice, in consequence of the extension of the wall. Passive venous congestions of the viscera ensue in consequence of the dilatation and weakened contractive force of the ventricle, and morbid changes in the various organs result.

Etiology.—The general conditions giving rise to hypertrophy and dilatation have already been considered under the head of general etiology. Dilatation may result from any cause giving rise to increased endocardial tension, or impaired nutrition of the heart walls. Acute primary dilatation is often brought about by sudden great exertion, as heavy lifting, or ascending a high mountain. Sudden fright or emotion have been known to produce dilatation. Especially do these causes operate in those of feeble resisting powers, as in youths or soldiers as first noted by Da Costa. Athletic and gymnastic sports may bring about acute dilatation in those who have had no training, or insufficient training. The same holds true in horses, who, like men, may become "broken-winded" from some unusual or prolonged exertion. Patients so afflicted may be unfitted for their usual occupations for a brief period, or may become permanently incapacitated, and sometimes develop valvular disease.

Impaired nutrition and consequent weakness and diminished resistance of the heart walls, resulting in dilatation may be due to chronic degenerations; myocarditis arising in the course of or from specific fevers, especially scarlet fever; acute endocarditis or pericarditis; anemia, leukemia and chlorosis, general malnutrition; alcoholism and syphilis.

Symptoms.—In acute dilatation, the onset is sudden. There is rapidly progressing dyspnea and palpitation, possibly severe cardiac pain, and the general signs and symptoms of obstructed venous circulation.

The symptoms of chronic dilatation are largely those of an enfeebled circulation and general venous congestion of the viscera. The patient may complain of headache, usually worse when sitting up, attacks of syncope and a cough are frequently present; the pulse is feeble, the arteries empty and the veins distended. The chief symptoms are those due to venous congestion of the various organs: *Brain.*—In acute cases there is congestion and edema of the pia mater, with delirium, delusions, sleeplessness, mental dullness and headache. In chronic cases the same symptoms gradually develop, with an effusion into the ventricles of the brain, and the patient has attacks of vertigo, often relieved by a copious epistaxis; black specks before the eyes and buzzing in the ears. *Lungs.*—There may be congestion and edema; areas of hypostatic pneumonia; bronchitis with cough and expectoration; slight hemorrhages. In chronic cases the congestion is chronic and is known as the "pneumonia of heart disease" or "brown induration." The chief symptom is dyspnea, which is first only noticed on exertion, but gradually becomes constant orthopnea. *Pleura.*—Hydrothorax with its usual symptoms and physical signs. *Stomach.*—

Gastric catarrh. *Intestines*.—Intestinal catarrh with diarrhea or more often constipation. *Liver*.—Congestion with functional disturbances and catarrhal jaundice. In chronic cases there may be an associated cirrhosis. *Peritoneum*.—Ascites with usual symptoms and physical signs. *Kidneys*.—Chronic congestion or chronic diffuse nephritis. The urine is scanty, often albuminous and sometimes casts are present. "A practical rule is that whenever the urine is turbid and deposits urates day after day, irrespective of diet, mode of life, or exercise, a failing heart should be looked for." (Lockwood.) *Skin*.—Cyanosis is sometimes present. There is congestion and some edema, the latter effacing lines and wrinkles. Edema is first noticed in the lower extremities, finally extending and increasing so as to constitute a general dropsy.

Physical Signs.—The physical signs are such as indicate a weak and enlarged heart. *Dilatation of the Left Heart*.—*Inspection*.—Veins of the surface distended and enlarged; indistinct cardiac impulse, often diffused and wavy; if associated with tricuspid insufficiency, there is pulsation of the jugular.

Palpation.—Feeble, diffuse, irregular, vibratory impulse. The visible impulse can not always be felt on palpation. The apex beat may be quick and sharp, but shows weakness, and is sometimes entirely absent.

Percussion.—There is an enlarged area of dullness especially transversely, frequently extending to the left as far as the anterior axillary line. Vertically it extends from the second rib downward to the sixth, or even, in extreme cases, as far as the seventh or eighth rib.

Auscultation.—The first sound is short and sharp, simulating the second sound in valvular disease, and the second sound is weak or absent. In some cases the first and second sounds are alike and equidistant, showing a short, ill-sustained systole. This is a serious sign, and it is spoken of as "embryocardia." When, as is usually the case, valvular lesions are present, the sounds are obscured by cardiac murmurs.

Dilatation of the Right Heart.—In dilatation of the right heart the ventricle is dilated, the enlargement is to the right and downward, the impulse feeble and wavy, being felt generally below the xiphoid cartilage and also to the left of the abdomen in the fifth and sixth interspaces. If the right auricle be also dilated, there is a pulsation in the third interspace. Percussion shows dullness extending one inch or more to the right of the sternum, and even with the fourth interspace. Auscultation shows the accentuated second pulmonary sound to be replaced by a weak second sound, the latter sometimes being entirely absent.

The first sound varies, being shorter and sharper at first, but feeble and indefinite as the case advances. The so-called canter rhythm is common, as are both irregularity and intermittency.

Diagnosis.—The presence of the physical signs above mentioned together with a clear history is usually sufficient for diagnostic purposes. There should be no difficulty in differentiating between hypertrophy and dilatation, the former showing powerful heart action and the latter weak heart action with symptoms of venous congestions and dropsy. It is not always an easy matter to determine when dilatation begins with an existing hypertrophy. The strong, well-defined, heaving apex beat of hypertrophy gives way to one more short and snappy, and the pulse becomes more frequent, weak and irregular.

Prognosis.—A heart once dilated never returns to a normal condition and while the patient's sufferings may be relieved and life greatly prolonged by proper treatment, yet the patient is in constant danger, and sooner or later must succumb to the inevitable. Death may result gradually from exhaustion or may occur suddenly from cardiac failure due to some undue exertion or excitement.

Treatment.—The treatment is essentially the same as that already described for valvular disease, to which the reader is referred.

MYOCARDITIS.

Synonym.—Carditis.

Definition.—Inflammation of the muscular tissue of the heart which may be either acute or chronic.

Acute Myocarditis.

Varieties.—1. Acute parenchymatous myocarditis. 2. Acute diffuse interstitial myocarditis. 3. Acute circumscribed myocarditis, or acute suppurative myocarditis.

Pathology.—*Acute Parenchymatous Myocarditis.*—This form is also known as parenchymatous or albuminoid degeneration or cloudy swelling. There is granular degeneration of the muscle fibers of the parenchyma, the entire muscle appearing pale and turbid, and is very soft, being described by Lænnec and Louis as “softened heart.” Fatty degeneration sometimes follows.

Acute Diffuse Interstitial Myocarditis.—The interstitial fibrous tissue is infiltrated with round cells, and the muscular fibers undergo granular or fatty degeneration. The heart muscle is pale, soft and easily torn, and usually presents a mottled appearance.

Acute Circumscribed Myocarditis.—This variety is of rare occurrence. It is also known as Acute Suppurative Myocarditis, or

Abscess of the Heart. There are small scattered areas of suppuration appearing in spots or streaks and usually surrounded by a hemorrhagic zone. The abscesses may rupture into the pericardium, or into one or more of the heart cavities. In the former case suppurative pericarditis results, and in the latter there may be produced a malignant endocarditis, or the pus entering the circulation may give rise to infective emboli in various parts. Occasionally also the blood finds its way from the heart cavities to the heart wall, producing dilatation and sometimes rupture. In some cases a fistulous communication is established between the two sides of the heart, resulting in an intermingling of the arterial and venous blood. In rare instances the abscess becomes encapsulated, the pus becomes inspissated and finally undergoes calcareous degeneration.

Etiology.— Acute parenchymatous and acute interstitial myocarditis usually met with in the course of infectious fevers or associated with rheumatic endo- and pericarditis. Rheumatic myocarditis may exist without either the endocardium or pericardium being involved. Acute circumscribed myocarditis is said to follow the interstitial variety, but it is usually due to infectious emboli reaching the heart in the course of septic diseases, septicemia, pyemia, ulcerative endocarditis, etc.

Symptoms and Diagnosis.— The symptoms are quite indefinite and are obscured by those of the primary disease. There is great cardiac weakness, palpitation, rapid, weak, irregular pulse, dyspnea and syncope. When such symptoms occur in the course of rheumatism or septic processes, acute myocarditis may be suspected. Later dilatation of the heart may occur, and give rise to the usual phenomena, particularly venous congestions.

Physical Signs.— The physical signs are those characteristic of dilatation and a weak heart. A variety of murmurs may be present, due to dilatation, endocardial changes, or, as Keil points out, to an imperfect valve closure consequent only upon a defective state of the heart muscle itself. The murmur of mitral regurgitation from relative incompetency is not unusual. Equidistant heart sounds, or “embryocardia” are sometimes heard, and are of serious import.

Prognosis.— The milder forms of parenchymatous myocarditis and of the circumscribed variety may recover. With these exceptions the disease is usually fatal. Sudden death may occur from undue exertion, even in apparently mild cases. This termination is most often seen in those cases following diphtheria.

Treatment.— Absolute rest is the most essential element in treatment. The recumbent posture must be continuously maintained. The free use of alcohol is generally recommended. Digitalis and all

the heart tonics in material doses are positively harmful. The remedy should be selected entirely in accordance with homœopathic indications. Among those most often required are *Acon.* (3x), *Arsen.* (3x), *Arsen. iod.* (2x), *Digit.* (1x), *Gels.* (2x), *Iod.* (2x), *Lach.* (6), *Naja.* (3x), *Phos.* (3x), *Spig.* (2x), and *Spong.* (3x).

Chronic Myocarditis.

Synonyms. — Fibro-myocarditis, Fibroid Degeneration, Fibroid Heart, Chronic Interstitial Myocarditis, Sclerosis of the Coronary Arteries.

Pathology. — Chronic myocarditis is, from a technical standpoint, not a true inflammation, but a fibroid change, induration of the interstitial connective tissue taking place. This may be diffuse or circumscribed, most often involving the wall of the left ventricle, the septum and the papillary muscles. The muscle on examination is found dotted with white, shining areas variously numerous. Minutely examined these are found made up of pure or part fibroid tissue, the muscular fasciculi being correspondingly destroyed. Usually the coronary arteries show arterio-sclerotic changes due to an obliterating endoarteritis, which latter is the most frequent cause of fibro-myocarditis. The disease may be associated with endocarditis and valvular lesions, or hypertrophy without valvular lesions may be present. Endocarditis may give rise to embolism of the coronary arteries or branches, thus cutting off the blood supply. From the cardiac thrombosis which sometimes results there may arise cerebral, renal, and pulmonary embolism with its usual consequences. Dilatation is a common sequence, sometimes resulting in what is known as cardiac aneurysm. Where the areas of fibroid change are localized, sacculated dilatation may result.

Etiology. — Chronic myocarditis is most commonly caused by arterio-sclerosis of the coronary arteries, resulting from the same conditions as give rise to endoarteritis elsewhere. Anemic necrosis is also a comparatively frequent cause, and not a few cases follow acute diffuse interstitial myocarditis. The disease may also result from a direct extension of a peri- or endocarditis. The excessive use of alcohol or tobacco or the presence of rheumatism, gout or syphilis are important etiological factors. The disease seldom occurs before middle life, and more often in advanced age, especially in those who have lived high and indulged freely in alcoholic liquors, or who have had syphilis. In such instances Bright's disease or diabetes are frequent complications.

Symptoms. — Symptoms are indefinite and often entirely absent, being frequently marked by the symptoms of the primary or associated disease. Autopsies often disclose advanced stages of indurative myo-

carditis which were not previously suspected. In some cases sudden death occurs without previous symptoms of disease. This may be due to the sudden blocking of one coronary artery, a not uncommon event in arterio-sclerosis of the coronary arteries. If symptoms are manifest, they may come on either gradually or suddenly and are essentially those of a dilatation; viz., dyspnea, palpitation, small, frequent and irregular pulse, precordial oppression or attacks of faintness, and, finally, venous stasis with cyanosis, edema, and congestion of the liver, stomach, and kidneys, feeble digestion and scanty urine. A slow pulse is a common symptom, and with it intermittency and inequalities are often combined. Angina pectoris is sometimes present and may be the only symptom. Attacks of vertigo and syncope are not uncommon, sometimes resulting fatally. Also after a hearty meal, or some unusual mental or physical exertion a pseudo-apoplectic seizure may occur and prove fatal, or more often recur at short or sometimes comparatively long intervals, finally ending in death.

Physical Signs. — These are unreliable. Percussion reveals an enlarged (dilated) heart. The heart sounds are feeble. The first sound lacks its muscular element and is more like the second, more purely valvular and therefore short. Both maintain for a time considerable distinctness but ultimately grow feeble. Occasionally there may be a mitral murmur which may be functional and transitory or permanent. A very characteristic point is the irregularity in rhythm and in force, one contraction being fairly forcible, another weak or feeble.

Diagnosis. — The diagnosis is extremely difficult. As a rule, it is necessary to rely upon the absence of the physical signs and symptoms of valvular disease, and the presence of those indicating a dilated and failing heart, the evidences of arterial degenerative changes, a persistently slow pulse and angina pectoris.

The history and age of the patient will also aid. The diagnosis from fatty degeneration is almost impossible, but the latter is most often specially related to obesity, and frequently occurs in high livers and in drinkers of indolent habits.

When murmurs are present, the diagnosis is rendered still more difficult, as these are so liable to be interpreted as signs of valvular disease.

Prognosis. — While chronic myocarditis ultimately proves fatal, death sometimes occurring suddenly from an attack of angina pectoris, syncope, or pseudo-apoplexy, yet the patient may live for many years in comparative comfort. The presence of associated arterio-sclerosis, chronic interstitial nephritis or diabetes is unfavorable, and portends a comparatively early fatal termination. Syphilitic myocarditis offers the most favorable prognosis both as to length of life and a possible cure.

Treatment. — The treatment is quite the same as that recommended for valvular disease, except that with the failing heart, stimulation must be brought about very cautiously if at all, and by the use of alcohol, strychnia or glonoine, without digitalis, the latter being contraindicated, in physiological doses, because of the already increased blood pressure in the sclerotic arteries. For the attacks of syncope the hypodermic use of the aromatic spirits of ammonia usually answers the best purpose. The habits of life should be simple and regular, the diet plain and easily digested, exercise moderate and regular, never spasmodic or excessive. Tobacco, alcohol and tea and coffee should be avoided. Plenty of fresh air and sunshine, bathing and friction of the skin and other usual hygienic measures for the general health are important. The medicinal treatment is purely symptomatic, and, as a rule, the remedies required and their indications are the same as detailed for other cardiac diseases. Syphilitic cases usually call for Mercurius, Kali iod. or other syphilitic remedies.

DEGENERATIONS OF THE HEART.

1. Anemic Necrosis.

Synonyms. — Anemic Infarct, White Infarct.

Definition and Etiology. — A localized degeneration of the myocardium caused by the occlusion of the coronary artery or one of its branches by an embolus or thrombus.

Pathology. — The left ventricle and septum are most commonly affected, due to the fact that the anterior coronary artery is the vessel usually involved. The areas of necrosis are small and circumscribed, whitish or grayish in color, and usually of an irregular wedge shape. These may soften and break down, or become hyaline and finally sclerotic, constituting the lesion of fibro-myocarditis.

Symptoms. — These are obscure and unreliable. Sudden death often occurs from the blocking of the coronary artery without previous symptoms having been present. Usually, however, the heart's action is weak and irregular, and there is more or less cough and dyspnea, due to the embarrassed circulation. Angina pectoris is not unusual.

Prognosis. — Death is the ultimate end. It may come suddenly with the first or any subsequent attack, or, fibro-myocarditis being established, the course of that disease is followed thereafter.

2. Fatty Degeneration.

The term "fatty heart" is made to include not only fatty degeneration, in which the heart muscle has been converted into fat, but also

a distinctly different affection, fatty infiltration or fatty overgrowth in which an excess of fat is deposited in and about the heart, and which will be considered separately.

Pathology. — Fatty degeneration also known as fatty metamorphosis, may be either general or local. Usually, however, the left ventricle is the seat of the disease. The color is yellowish, which at first shows in spots or strips, but later may affect the whole organ; the tissues are soft and easily torn, and to the touch have a greasy feeling, oil being yielded on pressure. There may be areas of brownish color—the so-called “brown atrophy.” This is especially seen in cases associated with valvular disease or senility. The heart cavities may be dilated, and in extreme cases may rupture. Microscopically, the fibers are seen to be occupied by minute globules distributed in rows along the line of the primitive fibers. (Welch.) In severe cases the fibers seem completely occupied by the granules.

Etiology. — In general it may be said that fatty degeneration is caused by any process or condition that interferes with the proper nutrition of the heart muscle. It may result from a failure in general nutrition, such as is found in old age, cachectic states, infectious and wasting diseases, such as anemia, carcinoma, phthisis or alcoholism. It may also result from a failure in the local nutrition of the heart, as occurs from chronic pericarditis with adhesions, hypertrophy, valvular disease, dilatation or feeble heart action from any cause, diseases of the coronary arteries, atheroma, aortic incompetency, etc. Fatty degeneration also results from a direct poisoning of the heart muscle. This may be caused by the action of phosphorus or arsenic. It is also claimed that the fatty degeneration which follows infectious diseases, such as diphtheria and typhoid fever, is due to direct poisoning of the heart muscle rather than to a failure in nutrition. The disease is more common in the male sex and after forty years of age.

Symptoms. — Fatty degeneration may exist without symptoms, sudden death occurring from sudden emotion or unusual exertion, or following the administration of ether or chloroform, where no cardiac disease had been suspected. Usually, however, the evidences of a feeble heart are present, though, according to Osler, extreme fatty changes may occur, as in pernicious anemia, and “be consistent with full regular pulse and a regularly acting heart.” Dilatation usually supervenes early, and it is probable that most of the symptoms attributed to the fatty heart are really due to the dilatation. In such cases there is dyspnea, which may be constant, or only present on exertion, weak heart sounds and irregular heart action, palpitation, and small, irregular pulse. Sometimes the pulse is greatly retarded, dropping to

thirty or forty beats per minute, and in rare cases even to ten or twelve. Severe attacks of cardiac asthma may waken the patient from sleep in the early morning hours, and occasional attacks of angina pectoris are not unusual. Syncope and pseudo-apoplexy and epileptic seizures sometimes occur. The patient may have delusions and may even become maniacal. Toward the close there may occur the Cheyne-Stokes breathing, especially in connection with the comatose condition that simulates so closely an apoplectic seizure.

Physical Signs are absent or indefinite, and their absence, to such an extent as to be inadequate to account for the cardiac enfeeblement, is in itself diagnostic of a fatty heart.

Diagnosis.— The diagnosis is decidedly obscure and uncertain. Often in extreme cases the disease is unrecognizable. Feeble cardiac sounds with slow pulse, attacks of cardiac asthma or Cheyne-Stokes breathing justify a probable diagnosis, though even here the possibility of a fibro-myocarditis should not be overlooked.

Prognosis.— The diagnosis is grave, death occurring, either suddenly or gradually, in most cases. Though in mild forms following anemia, wasting diseases, and infectious fevers, the patient may recover gradually as the general health improves. The general opinion is that when degeneration is once well established, the muscular structure can never be restored to its normal condition.

Treatment.— The treatment is in all respects the same as that of dilatation and fibro-myocarditis. It should be remembered, however, that cardiac stimulants are, in a great measure, contraindicated, and should only be resorted to under great emergency, and then administered with extreme caution. Absolute rest, nourishing diet, and symptomatic medication, are the essential points in treatment. According to Dr. Halbert, *Cratægus* "is a safe and sure remedy" in the fatty heart of old people.

3. Fatty Infiltration.

Pathology.— Fatty induration or fatty overgrowth of the heart is the *Cor Adiposum* of the older authors, and is not a degeneration of the heart muscle, but may ultimately lead to that condition. It consists in an infiltration of fat between the muscular fibers, and may extend deep into the muscular substance, even as far as the endocardium and the papillary muscles. In some instances, especially in cases of general obesity, the outside of the heart is so covered with fat that the heart muscle is invisible, sometimes measuring an inch or more in thickness. In extreme cases the muscular fibers become atrophied, or undergo pressure degen-

tion. The heart wall is weakened, and dilation often supervenes. The nutrition of the heart muscle being interfered with, fatty degeneration may take place, and become the ultimate cause of death.

Etiology.—The condition is much more common in men than in women and usually occurs with general obesity and between the fortieth and seventieth years of age. It may occur in connection with the cachexia of old age and that of phthisis and carcinoma.

Symptoms and Diagnosis.—The symptoms are indefinite, being chiefly those of cardiac weakness, the presence of which, associated with general obesity, indicates the condition, which at best can only be inferred. Sudden death may occur from rupture of the heart.

Treatment.—The treatment is that of general obesity, to which the reader is referred. It consists chiefly in the proper regulation of diet and systematic exercise. Oertel's method, described elsewhere, is recommended, but should never be employed if there is an associated valvular disease with failing compensation, or when the arteries are decidedly atheromatous. The chief homœopathic remedies are *Phosphorus* (3x) and *Arsenicum* (3x).

ANEURYSM OF THE HEART.

Aneurysm of the heart may involve the heart walls, or only a valve be implicated.

Aneurysm of the walls is usually situated in the left ventricle near the apex, being rarely located elsewhere. It results from weakening of the walls by chronic myocarditis, by endocardial ulcerations of malignant endocarditis, or by injury. The size of the aneurysm varies from the size of a pea to dimensions equal to those of the heart itself. The aneurysm may be sacculated or partitioned, and even multiple. Rupture rarely occurs.

Aneurysm of a valve consists of a saccular projection from the ventricular surface of a sigmoid or cuspid leaflet, where the valve is weakened by ulceration through one of the lamellæ, the intravascular or intracardiac pressure furnishing the distending force. It is much more common in the aortic segments. It results from softening or erosion following acute endocarditis, the segmental endocardium being destroyed permits of dilatation from intracardiac blood pressure. Rupture is of common occurrence, resulting in extensive destruction and valvular incompetency. There are no symptoms or signs by which the presence of aneurysm of the heart can be determined with any degree of probability. The prognosis is grave. Death may result suddenly from rupture into the pericardium, but more often it occurs gradually from cardiac weakness.

RUPTURE OF THE HEART.

Rupture of the heart only occurs when the heart muscle has been weakened by disease. Fatty degeneration is the most frequent cause; anemic necrosis, due to obstruction of a branch of a coronary artery from thrombosis, or an infectious embolus is the next frequent cause. It may also result from fibro-myocarditis, endocardial ulcerations, broken-down, carcinomatous and other tumors and gummata. It may be either partial or complete. In the former case valvular incompetency results, and in the latter, death follows in most cases within a few minutes, or, rarely, is deferred for several hours or even days. In all cases the patient experiences agonizing cardiac pain, oppression, dyspnea, anxiety, rapid, feeble pulse and symptoms of collapse. The condition is rarely recognized before death, which invariably results, save in very rare cases of partial rupture which sometimes recover. It usually occurs after fifty years of age, and ordinarily follows some unusual exertion, but may occur while the patient is at rest. The anterior portion of the left ventricular wall near the septum is the favorite seat.

The *treatment* is entirely prophylactic. Patients known to have any myocardial degeneration rendering them liable to rupture of the heart should be warned of their danger and exhorted to lead quiet lives, avoiding all bodily and mental strain. If rupture is suspected to have occurred, the patient must be placed at once in a horizontal position, and kept perfectly quiet, such remedies being administered as the exigencies of the case require.

III. NEUROSES OF THE HEART.

PALPITATION.

Definition. — An abnormally rapid action of the heart, of which the patient is uncomfortably conscious. The term is also applied to fluttering, tremor, and other unpleasant cardiac sensations. The condition is often subjective, the heart's action being normal. Palpitation may be associated with functional or accidental murmurs, and may be in rare instances a symptom in organic cardiac disease.

Etiology. — "The cause of palpitation of the heart is a reflex inhibition of the vagus action, that enables the accelerators to run away with the heart." (Lockwood.) This may be the result of a variety of causes operating upon nervous temperaments; especially in those suffering with hysteria and neurasthenia, or, who are recovering from serious illness, and are consequently weak and nervous. The female sex are

more prone to palpitation of the heart than males, and especially near puberty or the climacteric. It rarely occurs in those of advanced years. Ovario-uterine irritation is the most common cause (reflexly) of palpitation in women. In a like manner, it may be caused by gastric or intestinal irritation, flatulent dyspepsia being a frequent cause. Rectal disease is a not uncommon cause. The most common direct causes are the effects of mental excitement, depression or emotion, and the abuse of tea, coffee, alcohol and tobacco. Anemia is both a predisposing and exciting cause. It may occur as a sequence of acute infectious fevers from the effects of the toxins in the blood upon the cardiac accelerators.

Symptoms.—Palpitation is the chief symptom, but it is usually associated with other nervous and reflex symptoms whose names are legion, and can not be enumerated. The attacks are usually paroxysmal, lasting from a few minutes to several hours, but may be constant, in which case it is known as tachycardia. In many instances there is only a fluttering of the heart which may rapidly pass away. In all cases the essential feature lies in the patient's consciousness of the increased heart action, usually resulting in great mental anxiety. The pulse may be very rapid and strong, or have a normal rate and weak. In most cases there is a sensation of "goneness;" frequently nausea; dyspnea; pale face, sometimes flushed; cold sweat; eructations of gas and finally the abundant passage of watery urine.

Diagnosis.—There are no physical signs except in those rare cases where palpitation occurs in the course of organic disease, or where functional or accidental murmurs are present. The latter are always systolic, a diastolic murmur always indicating organic disease. Palpitation is always in itself a pure neurosis even though it occur in a diseased heart. It is rather relieved than aggravated by exertion, as in organic disease. The history of a nervous temperament and the character of the cause, greatly aids the diagnosis.

Prognosis.—There is no danger to life, though it is sometimes very difficult to remove the underlying cause and effect a permanent cure. Most authors agree that hypertrophy of the heart may occur as a sequence.

TACHYCARDIA.

Synonyms.—Tachycardia Paroxysmal, Synchopexia, Rapid Heart.

Definition.—An abnormal paroxysmal rapidity of the heart's action, of which the patient is conscious, and which occur without any evident cause.

Pathology and Etiology.—A rapid pulse is physiological after

exertion, in the newborn, and in certain individuals, who, though in perfect health always have a rapid pulse. Tachycardia is due to paralysis of the inhibitory nerve of the heart or to stimulation of the cardiac accelerator nerves. The term is usually applied to cases where the pulse runs 200 or more to the minute. It may be a pure neurosis and arise from the same causes, reflex and otherwise, that excite palpitation, and which have already been considered. It may also be symptomatic, occurring in the course of various diseases. Anders divides this class of causes as follows: “(a) central, and (b) peripheral. In the former are especially to be placed tumors, clots (due to hemorrhage), and softening of the medulla and cord; and in the latter, tumors, aneurysms, enlarged lymph glands (which paralyze the vagus by exerting pressure upon it either in the neck or thorax), and neuritis, affecting the pneumogastric nerve. The latter lesion may be associated with polyneuritis (alcoholic or infectious).”

Symptoms.—The characteristic feature of tachycardia is that it does not produce the disturbance of the system that is found with a rapid pulse under other circumstances, as in exophthalmic goiter, palpitation, cardiac failure, etc. Therefore outside of the paroxysms of rapid heart action there are none or very few symptoms. The paroxysms occur at irregular intervals and may last for a few minutes, or for several hours. The heart beats may run from 150 a minute to even 250 or 300. Sometimes the pulse is full and strong, but usually it is small, feeble, easily compressed, and sometimes irregular. The symptoms of dyspnea, etc., so common in palpitation are rarely present.

Diagnosis.—Paroxysms of rapid heart action, without the usual attendant symptoms common to palpitation, and without the physical signs of organic cardiac disease, are justifiably pronounced tachycardia.

Prognosis.—This condition may occur at varying intervals for many years without any appreciable impairment of the general health. When symptomatic, reflex or otherwise of remediable pathological states, tachycardia is often cured, but not always. When occurring late in life, it may indicate senile changes which are liable to suddenly terminate life at any time.

Treatment of Palpitation and Tachycardia.

The treatment of these conditions is essentially the same. When treating such cases outside of the immediate paroxysm the chief essential is to discover and remove the cause if possible, either by hygienic, therapeutic, or surgical measures. At the time of the paroxysm the

patient should be placed in bed in a darkened room, kept absolutely quiet, and assured that there is no possible danger. The clothing should be loosened, and ice or ice-cold drinks administered in small quantities. Sometimes hot and gently stimulating drinks are more grateful to the patient, and exert a better influence. I have frequently cut short an attack by giving a cup of hot coffee, of moderate strength, without cream or sugar. Ice applied to the precordial region is a common and efficacious remedy. In women, ice applied over the ovaries is often beneficial. Sometimes pressure upon the vagus in the neck, or over the ovaries will promptly arrest an attack. In all cases the indicated remedy should be persistently administered.

Therapeutics.—**Aconite** (2x).—Palpitation from fright. Great anxiety and restlessness; difficult breathing; confusion in head; flying heat in face, pressive pain in cardiac region.

Coffea (3x to 30x).—Palpitation from emotions, especially excessive joy; excessive mental and physical excitement; sleeplessness.

Ignatia (3x).—Palpitation from grief or suppressed emotion; melancholy; hysteria.

Chamomilla (3x to 30x).—Nervous and excitable; peevish and irritable; cases resulting from anger or violent excitement; hysteria.

Spigelia (3x).—Palpitation so violent as to be both audible and visible; great dyspnea; irregular, tremulous action of the heart.

Moschus (2x).—Frequently of great value in relieving the paroxysm, especially in hysterical cases.

Nux moschata (3x to 30x).—Palpitation with fainting, followed by sleep. Enormous bloating of the abdomen; much loud belching of gas; hysteria.

Nux vomica (3x to 30x).—From indigestion; worse after eating; from highly seasoned foods, coffee, tobacco, and alcoholic liquors; sedentary habits; close application to business; protracted study, characteristic gastric and intestinal symptoms.

Cinchona (3x).—From debility and anemia due to loss of vital fluids or long illness; much flatulence.

Gelsemium (2x).—From depressing emotions, fright or grief; anticipation of some unusual ordeal; from tobacco.

Glonoin (3x).—Violent palpitation or fluttering; distinct pulsation over the whole body, felt especially in the head; undulating or wave-like motion in the brain; from becoming overheated in the sun; from fright or emotion.

Caffein valerianate (1x).—This is my favorite remedy to control palpitation when no other remedy is well indicated. The *Valerianate*

of *Ammonia* in one grain doses, frequently repeated, is quite useful in hysterical cases.

Consult also: *Arsen.*, *Asaf.*, *Cact.*, *Camph.*, *Cimic.*, *Coccul.*, *Digit.*, *Ferr.*, *Lilium.*, *Natr. m.*, *Phos. acid.*, *Puls.*, *Valerian.*, *Scutellaria* and *Scpia*.

BRACHYCARDIA.

Synonyms.—Brachycardia, Slow Heart.

Definition.—An unnatural slowness of the pulse.

Pathology and Etiology.—Brachycardia is the opposite of tachycardia, yet in its pathologic and etiologic relations there is much similarity. Like the latter it is often physiologic. It is not unusual to find a rate of 50 or 60 in a healthy person. I have seen several at 40, and cases at 20 are reported, some even at twelve, nine and seven. These instances of extremely slow rate are apt to be associated with such nervous diseases as epilepsy and catalepsy. Like tachycardia this condition may be purely neurotic or be symptomatic—secondary to other diseases. True brachycardia occurs whenever both pulse and cardiac systole are abnormally infrequent. When the pulse is slow but the heart beats normal, it is known as false brachycardia. The latter is usually due to a dilating heart with myocardial degeneration. True brachycardia, either neurotic or symptomatic occurs under the following conditions according to Riegel:—

- (1) Convalescence from acute fevers, such as typhoid, pneumonia, diphtheria, acute rheumatism, and the like.
- (2) Diseases of the digestive apparatus, especially dyspepsia, but also ulcer and cancer of the stomach.
- (3) Rarely in diseases of the respiratory system.
- (4) Diseases of the circulatory system, more frequently those involving the muscular structure of the heart, and associated with deficient nutritive supply, especially conditions succeeding obstruction to the coronary artery.
- (5) In nephritis.
- (6) From the action of toxic agents, including the uremic poison, lead, alcohol, coffee and digitalis.
- (7) Certain diseases of the nervous system, including apoplexy, brain tumors, especially those involving the medulla and cervical cord.
- (8) Finally, affections of the skin and sexual organs.

The *prognosis* is grave when occurring from cerebral or advanced cardiac disease, and often indicates a rapidly fatal termination.

Treatment.—The cause should be ascertained and eradicated if possible. When occurring in the course of organic diseases, temporary

stimulation may be required. For this purpose strychnia, glonoine, caffeine, aromatic spirits of ammonia and amyl nitrite are recommended. Alcohol is contraindicated. A cup of black coffee is often beneficial. The *therapeutics* should be based upon the totality of the symptoms, and the causal conditions, and not upon the slow pulse alone. Thus, any remedy of the *Materia Medica* may possibly be indicated. The chief remedies in which a slow pulse is characteristic are *Ascl. cor.*, *Can. ind.*, *Digit.*, *Laur.*, Opium and Ferrum. The following remedies causing a slow pulse are recommended as trustworthy by Dr. E. M. Hale: Aconite, adonis, amygdala amara, apocynum cannabinum, asparagus, baryta, cactus, caffeine, cannabis indica, chelidonium, convallaria, colchicum, digitalis, enonymin, gelsemium, hellebore, helonias, hydrocyanic acid, iberis, bromide of potassium, cyanide of potassium, nitrate of potassium, kalmia, lobelia, lycopus, cyanide of mercury, naja, nicotine, oleander, opium, plumbum, secale, scutellaria, spigelia, kola, strophanthus, veratrum album and veratrum viride.

ARRHYTHMIA.

Definition.—Irregular beating of the heart and pulse. The term denotes an absence of rhythm in the heart's action.

Varieties and Etiology.—Arrhythmia occurs in its simplest form when there is an occasional intermission in the beat, the pulse being regular during the intervals. This may occur only once in twenty or more beats or as often as every second or third beat. The beats may intermit at regular intervals, but be unequal as to fullness and strength, or may intermit at unequal intervals, or be altogether irregular. The latter condition is known as *delirium cordis* and is seen in cases of extreme dilatation and advanced exophthalmic goiter. When occurring only occasionally or at regular intervals, it may be due simply to indigestion, especially with much flatulence, or result from the use of tobacco or coffee. It is sometimes associated with chronic gout. In many instances it is supposed to be due to nervous influences, the exact nature of which is not always known. It may be due to organic cardiac changes in which it is of more serious import.

In the paradoxical pulse of Kussmaul the beats during inspirations are more frequent but less full than during expiration. It occurs in a weak heart, chronic pericarditis, and other conditions where the normal relation of respiration to the heart's dilatation and contraction are interfered with. The bigeminal and trigeminal pulse is where two or three beats follow each other in rapid succession, with a comparatively lengthy interval between. This is common in mitral disease, more especially in mitral stenosis.

Embryocardia, or fetal heart rhythm, is a condition in which the first sound is shortened, and therefore more like the second, the resultant being a sound similar to that of the fetal heart. It occurs especially in the latter stages of dilated heart, in which the muscular element of the first sound has become lost because of weakness, and the sound is purely valvular. It is also found in the later stages of fevers.

The gallop or cantering rhythm, resembles in sound the footfall of a galloping horse. It is the result of the reduplication of the second sound, a synchronous closure of the aortic and pulmonary valves. The second sound is seemingly broken into two parts, more rarely the first sound. It occurs in arterio-sclerosis, in a fatty, dilated heart, in acute myocarditis, in Bright's disease, and is said to sometimes occur in healthy persons.

The following is the classification of the causes of arrhythmia as given by Baumgarten :—

(1) Those due to central cerebral causes, either organic disease, as in hemorrhage or concussion, or more commonly psychical influences.

(2) Reflex influences, such as produce the cardiac irregularity in dyspepsia and diseases of the liver, lungs and kidneys.

(3) Toxic influences. Tobacco, coffee and tea are common causes of arrhythmia. Various drugs, as digitalis, belladonna and aconite, may also induce it.

(4) Changes in the heart itself. (a) In the cardiac ganglia. Fatty, pigmentary and sclerotic changes have been described in cases of this sort, and these may have an important influence in producing disturbances in the rhythm. But as yet we do not know their exact significance. They may be present in cases that have not presented arrhythmia. (b) Mural changes are common in conditions of this kind. Simple dilatation, fatty degeneration and sclerosis are most commonly present, the two latter being usually associated with sclerosis of the coronary arteries.

Diagnosis.—To differentiate between arrhythmia due to functional disturbances and that resulting from organic disease is of the greatest importance, and is often only accomplished with difficulty. The causes liable to produce functional arrhythmia must be carefully excluded, and the diagnosis of organic disease established by a careful study of the existing symptoms and physical signs.

The *prognosis* depends entirely upon the nature of the cause.

Treatment.—If the condition be due to functional disturbances, the latter must be removed by appropriate hygienic and therapeutic measures. If associated with organic disease, the treatment of the latter is the only consideration. Very rarely can a remedy be successfully prescribed simply because its pathogenesis shows an irregular

pulse. The totality of the symptoms must always be considered, and this necessarily includes the pathological features of the case. The remedies of the homœopathic *Materia Medica* causing an irregular or intermittent pulse are entirely too numerous to be mentioned here.

ANGINA PECTORIS.

Synonyms. — Stenocardia, Breast-pang, Neuralgia of the Heart.

Definition. — A symptomatic neurosis characterized by paroxysms of intense cardiac pain usually extending into the left shoulder and down the left arm, accompanied by a sensation of constriction of the thorax and a strong fear of impending death.

Pathology. — Angina pectoris is a symptom rather than a disease, and usually occurs in the course of some distinct and recognizable organic disease of the heart or arteries. In many instances organic changes can not be found, and in some cases, no doubt, though very rarely, the condition is purely functional. There have been many theories advanced as to the nature of angina, which have been purely speculative, their truth never having been demonstrated. No doubt the cardiac filaments of the phrenic and pneumogastric nerves are involved, and sometimes also the vaso-motor system. *Angina pectoris vaso-motoria* is a term given by Nothnägel to an angina where the vasomotor apparatus is chiefly involved. This condition is less serious than true angina, never resulting fatally.

Etiology. — Angina pectoris occurs exclusively in adults and far more frequently in men than in women. It is most commonly found associated with ossification or inflammation of the coronary arteries. It is also occasionally found in connection with aortic stenosis, aortic insufficiency, simple hypertrophy of the heart, and other conditions where there is increased arterial tension.

The exciting cause may be either mental emotion, undue exertion, indigestion, constipation, the excessive use of tobacco, or exposure to cold.

Symptoms. — The attacks occur in paroxysms lasting from a few seconds to half an hour. They may come on in the daytime, but severe attacks almost invariably occur at night. *Pain* is the cardinal symptom. This is neuralgic in character and most excruciating. It begins in the heart and extends up the neck into the left shoulder, and down the left arm and hand into the fingers, the latter usually feeling numb and cold. Associated with the pain is shortness of breath, precordial oppression, and an agonizing sense of approaching dissolution. The face is cold, ashen-pale and clammy, and usually bathed in a cold perspiration. The expression is one of agony and terror. The heart's

action may be normal, but usually it is accelerated. At times the pulse is rapid, feeble and irregular, but in most cases there is an extremely high tension. In a few seconds or minutes the attack may pass off, usually with eructations of gas, vomiting, or the passage of a large quantity of urine. Unfortunately such a termination does not always occur, the patient sometimes dying at the height of the paroxysm, or passing into syncope, which usually ends in death. There may be but one attack in those who recover, but more often they recur at intervals varying from a few days to many years, the patient living in a state of constant fear and apprehension and becoming gloomy and depressed. In angina pectoris vaso-motoria the pain is much less severe, and is preceded by vasomotor disturbances, pallor of the face, coldness and stiffness of the limbs, etc. The termination is always favorable.

Pseudo-angina is a term applied to a paroxysmal affection usually occurring in hysterical women, and sometimes in neurasthenic males and nervous children. The paroxysms come on gradually with distention of the abdomen, eructations of gas, excessive restlessness, flushed face, irritable pulse, diffused precordial pain, and general hysterical phenomena.

Diagnosis. — With the paroxysmal character of the attack and the symptoms above described, the diagnosis may be reasonably certain. To distinguish a true from a false angina is sometimes difficult, especially when a hysterical woman also has aortic incompetency. Usually, however, there are present nervous phenomena of such a character as to establish the character of the attacks. If there remains any doubt, the patient should be treated for true angina.

Prognosis. — The prognosis in true angina pectoris is unfavorable, in most cases a fatal termination occurring sooner or later, either during an attack or from exhaustion, the result of cardiac changes. Those cases associated with aortic disease, and those in which the exciting cause is preventable, offer the best prognosis. Death may occur during the first or any subsequent attack, but no one can know which attack is going to be the last.

Treatment. — The preventive treatment of angina in persons known to be subject to attacks is of the utmost importance. The general health should be carefully looked after in every way. All excitement and sudden muscular exertion should be avoided. The use of tobacco, stimulants and all indigestible articles of food must be prohibited. The spinal ice-bag applied forty minutes daily from the fourth dorsal to the third lumbar vertebra has proved curative. The patient should always carry pearls of nitrite of amyl, containing from 3 to 5

drops, and immediately on the first indications of an attack break a pearl in a handkerchief, and inhale the fumes. This is the most effectual treatment, but it sometimes fails. In such cases inhalations of chloroform may give relief. If there is great arterial tension, drop doses of *Glonoine* (2x dil.) should be rapidly administered. Chlorodyne in ten-drop doses, repeated often, sometimes answers well. If, in spite of the above measures, to which may be added hot fomentations over the heart, there is still no relief, and especially where there is no increase in arterial tension, a hypodermic injection of Morphia $\frac{1}{4}$ gr. and Atropin $\frac{1}{16}$ gr. combined, should be administered. The application of an ice-bag over the cardiac region is highly recommended, but I much prefer heat. Unfortunately there is usually not much time for consideration and whatever is done must be done quickly and with energy. For this reason an intelligent patient, or his family, should receive careful instructions as to how to act, and be prepared with all necessary equipment, should the emergency arise.

The *medicinal treatment* to be employed in the intervals between the paroxysms to prevent recurrence, must be entirely symptomatic and will be governed almost entirely by the nature of the associated disease. Arsenic is the remedy enjoying the greatest reputation in angina pectoris, and seems to be of great benefit in many cases whether administered in the higher or lower potencies or given in Fowler's solution. I usually give the thirtieth dilution three or four times a day, but have never found the drug of any value unless well indicated. The symptoms that may demand arsenic during the intervals are too numerous to recapitulate. No doubt the drug is often valuable also during the attack as its pathogenesis plainly indicates.

Aconite (1x).—The remedy most frequently used during an attack. It is especially useful in vasomotor angina from exposure to cold, with intense anxiety, coldness, pain at the heart radiating in every direction, with numbness, tingling, paresthesia.

Aurum muriat (3x).—Arterio-sclerosis; fatty degeneration, hypertrophy of heart, hypochondriasis, attacks of anguish, with tremulous fearfulness and restlessness, driving him from place to place.

Cactus (2x).—This is no doubt one of our best remedies. Increased action of the heart, with high arterial tension; sensation at the heart as though it were grasped in an iron hand or crushed in a vise.

Other remedies recommended for angina pectoris are: Am. carb., *Amyl nit.*, Arg. nit., Arn., Cupr., Cim., Dig., Glon., Hep. sulph., Kalmia, Lach., Lact. v., Lob., Lyc., Naja, Nux v., Ox. ac., Spig., Spong., Tab.

IV. CONGENITAL AFFECTIONS OF THE HEART.

Congenital affections of the heart, while seldom amenable to treatment, and, therefore, of limited clinical interest, nevertheless deserve a passing notice. They may result from arrested development, or from fetal endocarditis, or from both combined. The defects may be in the cardiac valves or orifices. *Pulmonary stenosis* is the most common affection, and has already been considered under that head. This condition alone is not incompatible with life, but being usually associated with defects of the ventricular septum it thereby becomes a much more serious affection. *Patency or incomplete closure of the foramen ovale* occurs and in itself is not inconsistent with a moderate length of life, but when, as is sometimes the case, there is associated with it other anomalies, it becomes of more serious import. *Defect in the septum* of either the auricles or ventricles may occur, the latter being comparatively frequent. When this is present, the blood is forced from the left ventricle into the right heart during systole, which leads to embarrassed respirations and venous congestions. If both the auricular and ventricular septa are defective, the number of the chambers is reduced to two, giving what is termed the *cor biloculare*, or reptilian heart.

Stenosis or incompetency of the tricuspid and mitral valves occur rarely. These conditions with their symptoms and physical signs are considered elsewhere.

Persistence of the ductus arteriosus, or a communication between the aorta and pulmonary artery sometimes exists. Also a communication between the aorta and the vena cava, or the aorta and the right auricle. These intercommunications all produce murmurs which can scarcely be separated. *Stenosis of the aortic orifice* is rare, and generally results fatally within a few weeks. There may be an increase or decrease in the segments of the valves, more especially the semilunar valves of the aortic and pulmonary orifices. An increase in valve segments is of no importance, but a deficiency is usually associated with other and more serious anomalies. In addition to the above there are many general anomalies of development which are rather pathological curiosities than of clinical interest. Among these may be mentioned *acardia*, or absence of heart, met in the monstrosity thus named; *double heart*, some present in high degrees of fetal defect; *dextro-cordia*, in which the heart is on the right side, alone or with other viscera. In *ectopia-cordis*, or dislocation, which is associated with fission of the chest wall and of the abdomen, the heart may be in the cervical, pectoral or abdominal regions.

Symptoms.—However varied the character of the congenital

affection, the one constant and distinct symptom is cyanosis, which usually comes on during the first week of life. This varies from a lead color to a purplish hue, and may be constantly present or only manifest upon exertion or when the child is crying. In nearly all cases there is more or less general arrest of development. Both the mental and physical powers are retarded. The fingers and toes are clubbed, and the nails curled and thickened like animal claws. The temperature is subnormal, and the child is susceptible to cold. The breathing is more or less embarrassed, especially on exertion. Cough is frequently observed and pulmonary affections common, often proving fatal.

Prognosis.—The prognosis is unfavorable. Most cases are still-born or die within a few days after birth. Occasionally in the milder grades of pulmonary stenosis, and in defects of the septa, life is prolonged for several years.

Treatment.—This is chiefly hygienic. Especially should the child be warmly clad, flannel being worn next the skin and the general health carefully guarded. The therapeutics are the same as recommended for valvular diseases in adults.

V. DISEASES OF THE ARTERIES.

ARTERIO-SCLEROSIS

Synonyms.—Arterio-capillary Fibrosis, Endoarteritis Chronica Deformans, Atheroma.

Definition.—An inflammation of the arteries, involving chiefly and primarily the intima, extending also to the media and adventitia, and resulting in an overgrowth of the connective tissue, followed by calcareous deposits.

Pathology.—The aorta is the most frequent and conspicuous seat of arterio-sclerosis, and the next most frequent is the coronary arteries, but the carotids, subclavians, brachials, radials, and ulnars, the iliacs, femorals, and especially the arteries of the brain, are frequently involved. The arteries to viscera, like the stomach and liver, are rarely affected, while the pulmonary arteries take an intermediate place. On the other hand, they are sometimes invaded to the exclusion of the aorta. Whatever invites high tension in the lesser circulation, tends to produce sclerosis in these vessels. The portal vein may also be invaded.

Arterio-sclerosis may be either circumscribed or diffuse. The former is also termed nodular. Circumscribed arterio-sclerosis presents localized areas of thickening. These present flat projections, and are yellowish or yellowish-white in color, hemispherical in outline, and

situated particularly about the orifices of the branches. They increase in area and in depth, gradually undergo atheromatous changes, and finally soften and break down, forming in the deeper tissues an atheromatous abscess, and, if near the surface, an atheromatous ulcer. Alongside of the atheromatous patches are also plates or scales of calcareous infiltration of the intima produced by a deposit of lime salts in the intercellular substance of the deeper layers. These calcareous deposits together with the ulcers and the narrowed lumen favor the formation of thrombi. Following the process of softening, rapid dilatation of the artery is liable to occur.

Diffuse arterio-sclerosis presents a similar condition generally distributed through the arterial system. Between the projecting areas the intima appears smooth and normal, but is, in reality, very much thickened. The media and adventitia are also involved, the former showing chiefly atrophic changes and a homogeneous hyaline infiltration. Later, especially in old people (senile arterio-sclerosis), calcareous deposits take place, rendering the vessels of bony hardness and perfectly rigid. This rigidity, together with the narrowed lumen, results in a loss, of the propulsive power residing in the elastic coat, a slowing of the current, and an increased intravascular pressure. These events tax the compensating power of the left ventricle, which therefore hypertrophies. This hypertrophy keeps up so long as its nutrition is maintained. The lessening of the blood supply to the various viscera partly accounts for such secondary affections as fibro-myocarditis, cirrhosis of the kidneys and cerebral softening. The latter occurs in localized areas due to the atheromatous condition, but is almost invariably preceded by thrombi. More often miliary aneurysms are formed in the cerebral arteries and result in rupture, cerebral hemorrhage and consequent hemiplegia. Aneurysm of the larger arteries is almost invariably, except in traumatic cases, due to atheromatous changes. Dry gangrene of the extremities sometimes occurs as a result of the obstructed circulation, either from the narrowed lumen or from thrombi or both.

Etiology. — There is more or less of a tendency to atheroma in old people, regardless of exciting causes. It is an evolution process that is physiologic. This condition seems to be hereditary which explains why senile atheromatous changes occur earlier in life with some than others, and why it sometimes affects an entire family. Men are much more liable to the disease than women. Among the exciting causes are chronic alcoholism, lead-poisoning, gout, syphilis, diabetes, and over-eating, especially with sedentary habits of life. There may be an antecedent history of uric-acid diathesis. Acute articular rheumatism is sometimes succeeded by arterio-sclerosis, and it frequently precedes,

accompanies or follows chronic Bright's disease, due to retained excrementitious matter. Arterio-sclerosis and chronic nephritis may arise from the same causes. They may therefore be excited and coexist independently of each other. Another cause of atheroma is increased arterial tension, due to prolonged muscular exertion. Sclerosis of the pulmonary artery is chiefly caused by mitral disease and emphysema.

Symptoms.—Subjective symptoms may be entirely absent, and, when present, are exceedingly diverse in their character, according to the location of the arteries chiefly involved. So long as a compensatory hypertrophy of the heart exists, the patient may enjoy general good health. When compensation fails, we then obtain the symptoms of cardiac dilatation and weakness. When superficial vessels are in an atheromatous state, they may be easily detected by their appearance and touch, and should be carefully examined when the disease is suspected. The radial, temporal, femoral, and brachial arteries are most accessible. The temporal arteries plainly show, on inspection, a dilated, tortuous, pulsating appearance, and the same condition is felt in the other arteries named, which, on touch, are rigid, and may be rolled under the skin like whipcord, the pulse being incompressible. The tension may be high, and yet sclerosis of the vessel wall be slight or absent. When doubt arises as to whether or not sclerosis exists, the pulse should be palpated by means of two fingers. If now, while compression of the pulse is made with the index finger, the middle finger detects a pulse wave, arterio-sclerosis is present. The tortuosity is increased during the systole, and decreased during the diastole. It does not always follow that an atheroma in one place implies an atheroma in another, since fatal rupture of an artery in the brain has occurred where there has been no sign in the radials, and *vice versa*.

The rigid wall, and the more or less narrowed lumen of the affected vessel or vessels, give an increased resistance to the circulation, thus requiring the heart to perform additional work in order to distribute the blood, and resulting in hypertrophy. This change is indicated by the heaving impulse, by an extension of the area of cardiac dullness, downward and to the left, and by accentuation of the second sound. Murmurs, due to regurgitation or stenosis, or both, may be audible with greatest intensity in the aortic area, when an extension of disease from the aorta to the semilunar valves, or to the endocardium, takes place. Cardiac dilatation and weakness, dyspnea and general edema may finally occur from degenerative changes, in the heart muscle, the result of atheroma and calcification of the coronary artery. Sclerosis of the coronary arteries may lead to "thrombosis, with sudden death; fibroid

degeneration of the heart; aneurysm of the heart; rupture and angina pectoris. Angina pectoris is not uncommon, and in the true variety is almost always associated with arterio-sclerosis." (Osler.) Sclerosis of the cerebral arteries gives rise to acute and chronic degeneration; spasm of cerebral vessels, with transient or permanent paralysis; and cerebral hemorrhages. Transient hemiplegia, monoplegia, or aphasia may occur in advanced arterio-sclerosis. Renal symptoms are present in many cases, due practically to an atrophic nephritis, the urine may be increased in quantity and of low specific gravity, with but occasionally hyaline casts and a trace of albumen, or uremic symptoms may develop and prove rapidly fatal. Dry gangrene of the extremities often results from the obstructed circulation. Respiration symptoms, especially those of bronchitis or an associated emphysema, are not uncommon.

Diagnosis.—The combined presence of hardened arteries, increased arterial tension, hypertrophy of the left ventricle, accentuation of the second aortic sound, and a history of gout, syphilis, or other causal condition, makes the diagnosis of arterio-sclerosis positive. Often the disease is not suspected until some accident, such as cerebral hemorrhage, or the rupture of an aneurysmal sac, suddenly terminates life.

Prognosis.—The ultimate result is invariably a fatal termination, though life may be prolonged to very old age. There is always some more or less serious complication present, and a danger of sudden death from rupture, especially in the cerebral form.

Treatment.—The treatment of arterio-sclerosis is chiefly preventive. Little can be done more than to retard the course of the disease, which is accomplished chiefly by regulating the habits of life and removing as far as attainable, all possible causal conditions. The diet should be plain and non-stimulating. Alcoholic drinks must be absolutely prohibited. The mode of life should be quiet, all excitement and active exercise being avoided. The medicinal treatment is purely symptomatic. The various salts of lime as well as those of soda, are often of value. *Aurum mur.* (2x) is highly recommended and undoubtedly when indicated is a valuable remedy. *Kali iod.* (1x) is particularly useful when there is present the history of syphilitic disease. *Plumbum* (6x), especially the iodide, is often indicated when renal disease is associated. *Digitalis* may be indicated and given in the potencies, but, as a rule, is harmful in physiological doses. *Convallaria* (1x) is to be preferred. Also consult Aconite, Arsenic., Hydras., Gels., Kalmia, Lach., Naja, Secale, Sulph., Verat. vir. and Zinc phos.

ANEURYSM.

Definition and Varieties.—An aneurysm is a circumscribed dilatation of an artery. An aneurysm may be true or false. A true aneurysm is where the dilatation involves all three coats of the blood vessel, though one or two may disappear later in the course of its growth. A false or dissecting aneurysm, on the other hand, starts at the outset with a laceration of one of the coats, usually the intima, the blood making its way between the layers, and may rupture through the outer coats. There is also what is known as arterio-venous aneurysm, where a communication exists between an artery and a vein. If there be an intervening sac, the term varicose aneurysm is applied, if the communication be direct, the condition is termed aneurysmal varix.

A true aneurysm may be sacculated, cylindrical or fusiform. They are usually fusiform or saccular. If the whole circumference of the vessel is dilated, the aneurysm is termed axial, and peripheral when confined to one side of a vessel. Small aneurysms occurring along the course of the cerebral vessels are termed miliary, on account of their minute size, though in rare instances, they may become very large.

General Pathology and Etiology.—There is always some weakness of the arterial coats so that they yield to the intravascular pressure. "The media probably weakens first in most cases, and extreme atrophy of both the intima and media is not uncommon in the later stages, so that the wall of the sac is often formed almost exclusively of the adventitia. The intima or media may become lacerated, and finally the external coat yields; this results in rupture, unless the adherent neighboring structures compensate for the natural wall." The most frequent cause of this condition is arterio-sclerosis. The conditions which give rise to the latter, and which have already been discussed are causative factors of aneurysm; chief among these are syphilis and alcohol. An embolus may weaken on the proximal side of the vessel. The latter may be due either to injury of the vessel wall by the mechanical effects of the embolus, or to inflammation and softening from an infectious embolus. A severe muscular strain may produce aneurysm, though it is highly probable that in such instances there has been a previous impairment of the arterial wall from sclerotic changes, even though of very mild degree. Osler describes a "Mycotic" Aneurysm, usually small and multiple, met with in ulcerative endocarditis, and in which he has found an extensive growth of micrococci. Aneurysms are most frequent in men, especially workingmen, and during the period of greatest physical activity, between thirty and fifty years of age, and more especially in those where alcoholic excesses and syphilitic disease form additional causative factors.

In aneurysms of the aorta about seventy-five per cent of the cases occur in the thoracic portion and twenty-five per cent in the abdominal aorta and its branches.

Symptoms.—An aneurysm, wherever situated, gives rise to four groups of symptoms: (1) The presence of a growing pulsating tumor; (2) its pressure on surrounding parts; (3) its effects upon the circulation of the blood; (4) the symptoms due to erosion and rupture.

Aneurysm of the Thoracic Aorta.

Thoracic aneurysm may occur in the arch of the aorta, in its ascending, transverse and descending portions, and in the thoracic aorta below the arch. Such aneurysm may but slightly exceed the normal caliber of the vessel, or it may be four inches or more in diameter. About sixty per cent of the cases are said to occur in the ascending portion and nearly thirty per cent on the arch.

Symptoms.—The most important symptoms are those due to pressure. Small aneurysms may exist without inducing any appreciable symptoms or physical signs. When they become large enough to produce pressure, the symptoms vary according to the location of the tumor, the amount of pressure it exerts, and the direction in which the pressure is exerted. Osler thus describes the results of intra-thoracic aneurysms, according to their location:—

“(a) *Aneurysms of the Ascending Portion of the Arch.*—When just above the sinuses of Valsalva they are often small and latent. The first symptom may be rupture, which usually takes place into the pericardium, and causes instant death. Above the sinuses, along the convex border of the ascending part, aneurysm frequently develops, and may grow to a large size, either passing out into the right pleura or forward, pointing at the second or third interspace, eroding the ribs and sternum, and producing large external tumors. In this situation the sac is liable indeed to compress the superior vena cava, causing engorgement of the vessels of the head and arm, sometimes compressing only the subclavian vein, and causing enlargement and edema of the right arm. Perforation may take place into the superior vena cava, of which accident Pepper and Griffith have collected twenty-nine cases. Large aneurysms in this situation may cause much dislocation of the heart, pushing it down and to the left, and sometimes compressing the inferior vena cava, and causing swelling of the feet and ascites. The right recurrent laryngeal nerve is often involved in these tumors. Death commonly follows from rupture into the pleura, or into the superior vena cava, less commonly from rupture externally, sometimes from heart failure.

"(b) *Aneurysms of the Transverse Arch.* — These may grow forward, erode the sternum, and produce large tumors. More commonly they are small and produce no external tumor, but cause marked pressure signs in their growth backward toward the spine, involving the trachea and the esophagus, producing cough, which is often of a paroxysmal character, and dysphagia. The left recurrent laryngeal is often involved in its course round the arch. A small aneurysm from the lower or posterior wall of the arch may compress a bronchus, inducing bronchorrhea, gradual bronchiectasy, and suppuration in the lung—a process which by no means infrequently causes death in aneurysm, and a condition which at the Montreal General Hospital we were in the habit of terming aneurysmal phthisis. Occasionally enormous aneurysms develop in this situation, and grow into both pleuræ, extending between the manubrium and the vertebræ, and may persist for years. The sac may be evident at the sternal notch. The innominate, less commonly the left carotid and subclavian, may be involved in the sac, and the radial or carotid pulse may be absent or retarded. Pressure on the sympathetic may at first cause dilatation and subsequently contraction of the pupil. Sometimes the thoracic duct is compressed.

(c) *Aneurysms of the Descending Portion.* — Pressure signs are not so marked. The pain is often intense, owing to erosion of the vertebræ. Dysphagia may occur. Compression of the lung or compression of certain bronchi may induce bronchiectasy, retention of secretions, and fever. A tumor may appear externally in the region of the scapula, and here attain an enormous size. Occasionally the aneurysms in this region are small and latent, and prove fatal by rupture into the esophagus. I have reported a case of sudden death, in which the heart and arch of the aorta were normal, and the stomach was distended with blood, which could not be accounted for until the esophagus was slit open, when it was found that a small aneurysm in the thoracic aorta, smaller than a walnut, had ruptured into the gullet. The sac may erode the vertebræ and open the spinal canal, producing compression of the cord. Death not infrequently occurs from rupture into the pleura."

Of the special symptoms to be noted *pain* is the most important, it being first and most constant. It may be sharp and acute when nerves are directly involved, or dull and boring when result of pressure on bone. The sharp pains are neuralgic in character and may extend all over the chest and down the arms, simulating angina pectoris. Sometimes they are unilateral. They may occur in an aneurysm of any part of the arch, but are most frequent in aneurysms of the ascending portion. The dull boring pains are localized at the site of the tumor.

Cough. — If the cough is due to pressure upon the larynx it is paroxysmal; it has a brassy, ringing sound. If the trachea is pressed upon, there is a paroxysmal dry cough, or there may be a tracheo-bronchitis with copious, thin, or mucous expectoration, sometimes bloody.

Alterations of the Voice. — With or without cough there may be hoarseness, aphonia or a stridulous voice. These may be due to direct pressure upon the larynx or trachea, or, accompanied with various degrees of paralysis of the cord, result from pressure upon the recurrent laryngeal nerve. Sometimes the symptoms of paralysis are present without other appreciable symptoms. The laryngoscope will reveal bilateral paralysis of the abductors of the vocal bands.

Dyspnea. — This occurs especially in aneurysm of the transverse portion. It is more noticeable on exertion and on changing position. It may be caused by direct pressure upon the trachea or left bronchus, or involvement of the recurrent laryngeal nerve.

Dysphagia from pressure of the tumor on the esophagus, is a frequent symptom, especially in aneurysm of the descending aorta anywhere in the thorax.

Physical Signs. — *Inspection* does not always give any positive signs, but as a rule, a visible pulsation is one of the first indications of thoracic aneurysm, and may be present when there is no bulging. The latter is usually seen and generally occurs above the third rib, to the right of the sternum. Aneurysms of the ascending aorta are found projecting in the left scapular region. As the tumor protrudes, the skin becomes smooth, shining and tense over it and previous to rupture may become gangrenous. Such a tumor may pulsate or not. The pulsation is, however, of great importance in the diagnosis. When present, it is synchronous with the systole of the ventricles. The heart's apex is often displaced downward and to the left.

Palpation discovers the pulsation whether it be visible or not, and the beating gives a peculiar expansive sensation. If there is bulging, the protrusion gives to the touch a yielding elastic feel; and if seated superficially, or having perforated the chest wall, there may be fluctuation. Sometimes a systolic thrill with a purring fremitus may be felt and sometimes a diastolic shock which is highly diagnostic. Very great tenderness is sometimes present over the seat of the aneurysm. Care should be taken in manipulation to avoid rupture of the sac.

Percussion may yield negative results even with large aneurysms, and at other times furnishes very distinctive signs. A variety of murmurs may occur, but usually a booming, systolic murmur, heard immediately over the tumor and transmitted in the direction of the

blood stream, being, therefore, distinctly audible in the vessels of the neck and along the course of the aorta. In rare instances a diastolic murmur only is present. A ringing aortic second sound is rarely absent in aneurysm of the aorta where aortic regurgitation is not present.

The *pulse* in the arteries beyond the aneurysm is slowed, the two radial pulses showing inequality in both time and volume. Aneurysms of the ascending arch alone delay all pulses equally. If the right radial pulse is enfeebled or delayed, the aneurysm will be on the right, involving the origin of the innominate. When the transverse arch is involved beyond the innominate, it is the left pulse that is the more affected.

Trachial tugging is a valuable sign in detecting deep aneurysms pressing backward upon the trachea or left bronchus. This consists in a dragging downward of the larynx with each systole of the heart. The patient should sit with his head slightly thrown backward so as to extend the neck, and the examiner stand behind him. The trachea is held up by gently inserting the ends of the fingers under the edge of the cricoid cartilage. If an aneurysm be present, a characteristic downward tugging will occur with each pulsation. This tugging is a sign of great value, although not absolutely pathognomonic. Occasionally there is a systolic tracheal blowing caused by forcing the air out of the windpipe by the systole.

Diagnosis. — The diagnosis of thoracic aneurysm may be quite clearly established if in addition to the history of an arterio-sclerosis and the causative influences already mentioned, especially alcoholism, syphilis, excessive physical exertion, and age and sex, we elicit the pressure symptoms already described, and obtain the physical signs of a pulsating tumor, with dullness on percussion, the characteristic systolic murmurs and the trachial tugging, together with the variation in volume and time between the radial pulses. Many obscure cases occur, however, in which the above conditions are not clearly defined, and in which a positive diagnosis during life is quite impossible.

Solid mediastinal tumors, especially sarcoma, often so closely simulate aneurysm that they present great difficulties in diagnosis. In such the pulsations are not expansile as in aneurysm, have less force, and have no systolic or diastolic shock. The area of dullness is more irregular. The ringing second aortic sound is absent, as is the trachial tugging and the variation in the pulses. Should a cachectic state develop and secondary glandular enlargements appear, the presumption is in favor of mediastinal disease. Abnormal pulsation in the aorta may occur in aortic insufficiency, in displacement of the aorta forward with spinal curvature, and in neurotic subjects, and may

simulate aneurysm, but pressure symptoms, pain, and variation and retardation of the pulse are absent.

Pulsating empyema on either side of the upper sternum may be confounded with a large aneurysm. An expansile pulsation is present, but other signs of aneurysm are absent, and septic symptoms occur. Pulmonary and laryngeal tuberculosis present some similarity to an aneurysm pressing upon the trachea, bronchus, larynx or recurrent laryngeal nerve. The general signs and symptoms of these diseases are not present in aneurysm.

Prognosis.—The prognosis is always grave, even though the physical signs may not be marked, or the symptoms distressing. Death may occur from rupture of an aneurysm when its presence has never been suspected. Recovery is possible but not to be expected. Death may occur suddenly from heart failure without rupture, or gradually from exhaustion, from direct pressure or from associated diseases. The point of rupture and the direction which the consequent hemorrhage takes, is of comparatively little importance, as death in any case results suddenly, save when the rupture is external, in which case, slight hemorrhages may occur and life terminate gradually.

Treatment.—Various methods of treatment for aneurysm have been suggested and more or less adopted, but it can not be said that any of them have proved successful to any considerable degree. Spontaneous cures sometimes occur regardless of any treatment, and in some instances where no treatment has been employed. The chief indication for treatment is to secure coagulation within the sac. To accomplish this, intravascular pressure must be diminished and the blood current retarded. This is best secured by absolute rest in the recumbent posture for from eight to twelve weeks. This can only be approximately secured, as absolute rest is an impossibility. The diet should be dry, all liquids eliminated as far as possible. All mental application and emotional excitement should be avoided. Cold applications sometimes afford considerable relief, and may be of material benefit. If the symptomatic indications warrant it, the patient should receive some remedy that will aid in controlling the circulation, such as Aconite (3x), Digitalis (2x), Gelsemium (2x), Veratrum viride (2x), or Secale (3x). As constitutional remedies Arsen. (3x), Ars. iod. (3x), Sulph. (6x), Calc. carb. (6x) and Calc. phos. (3x) are especially to be considered. Kali iod. is especially recommended by old-school authorities, particularly in cases occurring in a syphilitic subject. The drug seems to have the power of lowering blood pressure, and it is claimed has a specific action upon the diseased vessel, and markedly relieves the pain. The dose usually prescribed is from five to fifteen grains three

times a day. Dr. R. Hughes reports a case of carotid aneurysm as having been cured in four days by *Lycop.* (12). Dr. C. F. Nichols reports a case of thoracic aneurysm cured by *Spigelia*, followed by *Carbo veg.*, and later *Bryonia* and *Spigelia*. Dr. T. C. Fanning reports that *Spongia* has relieved the paroxysmal, dry, suffocative cough, coming at irregular intervals, especially on lying down, or drinking hot tea, also a distressing fullness in the stomach after eating, which attended an aneurysm of the descending aorta. Many of the symptoms arising in the course of aneurysmal disease can be promptly controlled by the indicated homœopathic remedy. Sometimes in the later stages Morphine must be given to relieve the terrible sufferings. Various methods of local treatment for securing coagulation and obliteration have been recommended, but only indifferent success has attended their use. The insertion of horse-hair, catgut, wire, and the injection of ergot and other styptics into the sac have been tried. Loreta's method has been followed in some cases by good results. This consists in filling the sac with fine silver wire pushed through a hypodermic needle, combined with electrolysis. Ligation of the carotid, subclavian, or both, has also been done for aneurysm of the aorta with satisfactory results. It is, however, a formidable operation. Superficial aneurysms are treated by ligature and compression. External rupture may be retarded by painting the surface with a solution of gutta-percha, by the use of ice-bags, or by a metal or an elastic support.

Aneurysm of the Abdominal Aorta.

Aneurysm of the abdominal aorta is of not nearly so frequent occurrence as that of the thoracic aorta. Its usual situation is near the celiac plexus, which is frequently involved. The tumor may project backward, in which case the vertebræ become eroded, or as is most often the case, its growth is forward, sometimes attaining a very large size. The various branches of the abdominal aorta, notably the celiac axis, the mesenteric, splenic, hepatic, and renal arteries, may also be the seat of aneurysm. These are usually small and their clinical history and diagnosis indefinite. Rupture may occur without necessarily fatal results.

Symptoms.—The chief and most constant symptom is pain, either diffuse and neuralgic in character, or circumscribed and boring or gnawing, due to the destruction of bone. In the latter case, also, the cord may become compressed and parasthesia and paraplegia result. Vomiting and gastralgia are common, and if embolism of the superior mesenteric artery occur, there are severe colicky pains.

Physical Signs.—If the aneurysm be very large, there may be an epigastric pulsation visible and sometimes an epigastric swelling. Palpation detects a pulsating tumor in the abdomen to the left of the median line. The pulsation is synchronous with the first sound of the heart, is expansile (Corrigan's sign) in character; and may be accompanied by a thrill. There may be heard a systolic, diastolic, or double murmur. The pulse in the femorals is retarded, and may be obliterated. Dullness may be elicited on percussion if the tumor is large and the abdomen emaciated. In some instances a murmur or soft bruit is heard on auscultation, and which is systolic in time.

Diagnosis.—A throbbing aorta may be mistaken for aneurysm. Osler says, "It is to be remembered that no pulsation, however forcible, nor the presence of a thrill or a systolic murmur, justifies the diagnosis of abdominal aneurysm unless there is *a definite tumor which can be grasped and which has an expansile pulsation.*"

Solid growths located over the abdominal aorta may give rise to an apparent pulsation, causing them to be mistaken for an aneurysm. The rule is in all cases of abdominal pulsation to place the patient in the knee-chest position; if the tumor is aneurysmal, the expansile pulsation continues; if not an aneurysm but a cancer, impacted feces, or other tumor, the pulsation at once ceases, the growth falling forward away from the aorta.

Prognosis.—The prognosis is unfavorable, although recovery is not impossible. "Death may result from (a) the complete obliteration of the lumen by clots; (b) compression-paraplegia; (c) rupture either into the pleura, retroperitoneal tissues, peritoneum, the intestines, or, very commonly, into the duodenum; (d) embolism of the superior mesenteric artery, producing infarction of the intestines." (Osler).

Treatment.—The general treatment is that of thoracic aneurysm. An additional method employed when the aneurysm is low down, is continuous pressure upon the proximal portion of the vessel under an anesthetic. The pressure must be steady but not too severe, as there is great danger of injury to the sac and consequent rupture.

SECTION IV.

DISEASES OF THE URINARY SYSTEM.

I. DISEASES OF THE KIDNEYS.

MOVABLE KIDNEY.

Synonyms. — Mobility of the Kidney, Floating Kidney, Palpable Kidney, Wandering Kidney, Ren Mobilis Nephroptosis.

Definition and Description. — The kidney is firmly fixed, being retained in position by its fatty capsule by the peritoneum and by the renal vessels. Under certain circumstances one kidney, and very rarely both kidneys, become movable, the degree of mobility varying, in some instances being so slight that it is only recognized, if at all, with great difficulty, and in others so great that the organ may be easily grasped by the hand through the abdominal walls. In the latter condition there is a mesonephron or peritoneal fold loosely attaching the kidney to the spine. Such cases possess a larger arc of mobility, and to these the term "floating kidney" is sometimes limited, but this term is applicable to all cases where the organ is freely movable. When it is only barely possible to feel the lower edge of the kidney on deep palpation, it is termed palpable kidney. The right kidney alone is affected in 76 per cent of all cases, both kidneys in 13 per cent, and the left kidney alone in 11 per cent.

Etiology. — Congenital cases are rare, yet it is probable that in most cases where a movable kidney is acquired, there is a congenital looseness of attachment which is increased by the causative conditions. Movable kidney is by far more common in women than in men, and in thin persons rather than in the obese. It is most common in multiparæ, in the laboring classes, and after thirty-five years of age. It may be due to repeated pregnancies, to tight lacing, to mechanical violence, such as falls or heavy lifting, too severe bodily labor, or to absorption of the fatty capsule. Heavy tumors of the

kidney, or tumors of adjacent organs, may displace the kidney downward. Enteroptosis, or Glénard's disease, is a condition where there is prolapse of all the viscera, including the kidney, and frequently also dilatation of the stomach.

Symptoms. — It is probable that in a majority of cases there are no direct symptoms whatever, the condition being discovered by accident, or only found post-mortem, its presence having never been suspected. In some cases, however, the condition gives rise to a train of nervous symptoms, mostly reflex in their character, and which are most marked where the mobility is only moderate; whereas such local symptoms as develop are most marked in extreme cases. The reflex symptoms include obstinate indigestion of every grade, flatulence, palpitation of the heart, cardialgia, neuralgic pain almost anywhere in the body, but especially in the abdomen and cardiac region; also irritable bladder and dysmenorrhea; also general "nervousness," neurasthenia, or hysteria, and in men hypochondriasis. The chief local symptom is a dragging pain or weight, which especially manifests itself while standing, walking, riding, or dancing, to which may be added a variable amount of pain. The latter is sometimes severe and of the nature of a nephritic colic with collapse, nausea, anxiety, scanty urination, etc. This occurs especially where, from rotation of the kidney, torsion of the ureter occurs, involving the renal vessels and nerves, and causing obstruction and backing of the urine in the kidney. Acute hydronephrosis may also be the result of such strangulation, which may be caused, too, by inflammatory bands. Pyelitis may also result.

Diagnosis. — A positive diagnosis requires an exceedingly careful and thorough physical examination, though, the displaced organ once outlined, there is little danger of mistaking it for any other condition. A movable spleen, tumors of the gall bladder, ovarian tumors, and tumors of the bowels have been confounded with a movable kidney.

The examination should be made by placing the patient in the dorsal position and employing bimanual palpation, by Israel's method of counterpressure. The right hand of the examiner is then placed in front, immediately next the skin, below the hypochondrium, while the left is placed over the lumbar region. The patient is directed to respire deeply and regularly, and to relax herself during expiration. The region between the two hands is carefully palpated, when, if there is any marked degree of displacement, or, rather, of lowered position, the organ can be felt as a firm, smooth, oval body, somewhat sensitive to pressure, which produces a sickening pain; this is quite characteristic. More rarely the pulsation of the renal artery can be felt. The detection of a movable kidney of the right side may be aided by asking

the patient to take a long breath, so as to depress the liver, and thus push the kidney down into reach. Sometimes the manipulation will be more successful in the knee-elbow position.

Prognosis.—The prognosis as to life is quite favorable, death being of exceedingly rare occurrence, and then only from torsion of the ureters, which can easily be overcome by surgical measures. Often the reflex symptoms are very obstinate, and are only relieved after operative procedures.

Treatment.—Many cases require no treatment, and none is indicated unless the displacement has given rise to symptoms. In some cases, the latter are so severe that opium suppositories or the hypodermic use of morphine is required. The general health should be looked after, and in some cases the "rest cure," with forced feeding, to increase the fat of the body, has been of benefit. The patient should lie quiet upon the back during the day as much as possible, and avoid undue exertion, straining at stool, etc. In some cases, benefit is obtained by placing the patient in bed for a month, and then adjusting a binder and a pad to keep the kidney in place. As a rule, however, the use of pads and supports has not proved successful. Anders says that "a transverse, oval, and concave abdominal shield, however, if placed between the umbilicus and the symphysis, and sustained from the sacral region by a pad connecting the shield with springs (or by an inelastic material passing over the hips, as recommended by Schatz), will give comfort, support and ease." In severe cases, stitching of the kidney—nephrorrhaphy—is the best procedure, and often proves an effectual cure, but this sometimes fails, as the anchorage is occasionally torn loose by some sudden or severe muscular effort. The removal of the kidney—nephrectomy—is a serious operation, and should only be resorted to in grave cases, and after all other means have failed.

ANOMALIES OF THE URINARY SECRETION.

Albuminuria.

Definition.—The presence of albumin in the urine.

Pathology and Etiology.—Albumin may enter the urine from other sources than the secreting substance of the kidney. The pelvis of the organ, the ureters, the bladder, and the urethra, and in the female the vagina and uterus in addition, are these sources. An inflammation of the mucous surfaces of these parts, involving the presence of pus corpuscles, may explain the presence of a limited amount of albumin. However, if in such cases there is present tube casts and

any considerable quantity of albumin, a co-existing kidney disease is to be suspected. Albumin may also be present when hemorrhage occurs from the mucous tracts above mentioned. Albumin may escape from the Malpighian tufts, and appear in the urine from other causes than the presence of serious organic changes in the kidney, as was once supposed to be necessary. Albumin may not only be absent in an advanced nephritis, but it may be present, and come from the kidneys, when there is no kidney lesion. The immediate cause of the presence of albumin in the urine, coming from the kidneys, "is the escape of the normal blood constituents, serum-albumin and serum-globulin, from the vessels into the renal tubules. This transudation of albumin indicates either a transient and slight, or a permanent and grave, nutritional disturbance of either the epithelium lining the glomeruli, or of that of the contained tufts of capillaries, or possibly, of the *membrana propria* or the epithelium of the uriniferous tubules. These changes induce and offer an abnormal perviousness to the albumin of the blood." (Anders.)

Two forms of albuminuria are recognized:—

1. *Albuminuria from Gross Renal Lesions.*—This includes congestion of the kidneys, acute or chronic, and organic diseases—acute and chronic nephritis; amyloid disease; fatty degeneration; suppurative nephritis, and renal tumors.

2. *Albuminuria without Gross Renal Lesions.*—(a) *Functional or physiologic albuminuria*, so called, may follow severe muscular exertion, sustained mental effort, excessive albuminous food, violent emotions, or cold bathing. A few hyaline casts may be present, especially after exertion. (b) *Cyclic albuminuria*, the albumin appearing periodically, usually after meals or on exertion, but generally being absent during rest at night or early in the morning. It is most common in adolescent anemic males, of poor nutrition, neuralgic, often neurotic, and even hysteric. The quantity of albumin is usually small, although it may be considerable, and transient glycosuria or occasional hyaline casts may be present. (c) *Febrile albuminuria* may occur in the course of fevers, especially when long continued—notably typhoid fever, small-pox, yellow fever and diphtheria. Albumin is present in small quantities, and is due to slight changes in the glomeruli caused by the febrile process. (d) *Albuminuria from Blood Changes.*—This may be seen in poisoning from alcohol, bile pigment, sugar, lead, mercury or arsenic; after administration of ether or chloroform, and in any of the severe anemias, purpura, scurvy, or syphilis. This also includes the albuminuria sometimes present in pregnancy or diabetes mellitus. (e) *Neurotic albuminuria* occurring after epilepsy, apoplexy, tetanus, or injuries to the head, and with exophthalmic goiter. (f) *Spurious*

albuminuria when arising from the admixture of blood or pus in the urine. This is not a true renal albuminuria, being due to inflammation of, or hemorrhage from, the mucous tracts of the urinary or genital systems previously referred to. In such cases tube casts do not appear.

When albuminuria is present persistently in considerable quantities, and especially when occurring in persons over forty years of age, it almost always indicates organic kidney lesion. In such cases there are usually found constitutional disturbances, uremic symptoms, hypertrophy of the left ventricle, dropsy, etc.

Tests for Albumin. — Both morning and evening urine should be examined. The urine should be free from all contamination such as vaginal or urethral discharges and all turbidity removed by filtration, or, in case of urates, by warming.

The Heat and Nitric-Acid Test. — This is the most common and at the same time, if properly conducted, is the most delicate and reliable test. The tube is filled about one-third full of urine and the latter boiled over a spirit lamp, the tube being so held aslant over the flame and slowly revolved, that the upper portion of the urine is brought to the boiling point. If opacity result, it is due either to albumin or to earthy phosphates. On adding a few drops of nitric acid the opacity disappears if due to phosphates; if due to albumin, it is permanent. It is very important that the acid should not be added first, as is sometimes directed, for it often happens that where a considerable amount of albumin is present, acid albumin is thus formed which is not precipitable by heat, and thus such quantities of albumin may elude detection.

The Contact Method with Nitric Acid, or Heller's Test. — Upon a small quantity of pure colorless nitric acid in a test tube is allowed to trickle an equal amount of clear urine, so that it will overlie the acid. If albumin be present, a sharp white band will appear at the contact of the two liquids. A somewhat similar zone may be formed by the action of nitric acid on urates if in excess, so that the more insoluble acid urates are precipitated. This zone, however, is not sharply defined, diffuses itself into the urine above, and disappears on the application of heat. A haze due to mucin may also occur above the albumin zone, and may obscure the test.

The Picric-Acid Test. — Pour a quantity of urine into a test tube, and add the picric acid solution drop by drop, and, as it passes through the urine, it is followed by an opaque white cloud if albumin be present. The test is very striking and beautiful. If cloudiness appears sometime after instead of at the time, it shows nothing. The test will not detect as small an amount of albumin as heat or nitric acid, but is an excellent confirmatory test. Some think the picric-acid test is also

best applied by the contact method, the urine being placed in the tube first and overlaid with the saturated picric solution because the picric acid is commonly lighter than the urine to be tested. If albumin is present, a white zone at once is apparent, together with a haziness that spreads downward with the diffusion of the liquids.

Quantitative Test.—*Esbach's test* is valuable in the quantitative analysis of albumin. This consists in using a graduated test tube, into which definite amounts of urine and a reagent composed of 10 parts of picric acid, 20 of citric acid, and enough water to make 1000 parts are carefully mixed by reversing several times the stoppered tube. After allowing this to stand about twenty-four hours, the height of the precipitated albumin is read off on an etched scale, which will indicate approximately the parts per thousand. Not less than 0.5 parts per thousand can be estimated correctly, however. Should there be a hematuria, if the percentage of albumin by Esbach's method, divided into the number of red cells per cubic centimeter of urine is less than 30,000, it suggests a purely hematuric albuminuria; if greater, it suggests an independent albuminuria. (Goldberg.)

Treatment.—The treatment of albuminuria is almost entirely that of Nephritis, under which heading the remedies for this condition will be noted.

Hematuria.

Definition.—The presence of blood in the urine.

Etiology.—Blood in the urine may come from the kidney, the pelvis of the kidney, the ureter, the bladder, or the urethra, and may be caused by diseases of these parts, or occur in the course of and caused by malignant forms of acute infectious fevers, as hemorrhagic smallpox or "black measles;" and certain hemorrhagic diseases, as scurvy, purpura hemorrhagica, hemophila or leukemia. Hematuria is sometimes also associated with malarial paroxysms. It also occurs as a manifestation of vicarious menstruation, and in some instances, especially in young persons, it occurs paroxysmally without any discoverable cause. It is met with in the tropics, the result of the presence of the parasites *filaria sanguinis hominis* and *distoma hematobium*. (Bilharz.) In almost all the cases occurring from the above-mentioned causes the hemorrhage is from the kidneys. The direct local causes of renal hemorrhage are traumatism, acute congestion or inflammation; rarely the atrophic form of chronic nephritis; toxic agents, such as cantharides, carbolic acid and turpentine; embolism, thrombosis or aneurysm of the renal vessels; tubercular inflammation; new growths; and calculous pyelitis. The local causes of hemorrhage

from the ureters are chiefly the passage of calculi and traumatism from intraabdominal operations. Hemorrhage from the bladder is caused by injuries, ulceration, ruptured veins at the neck of the bladder, malignant tumors and calculi. Hemorrhage from the urethra results from traumatism, especially injury from catheterization, calculi, foreign bodies, gonorrhea, chancroids, ulcers and parasites.

Diagnosis.—To discover blood in the urine is a comparatively easy matter, but to ascertain its source is not at all times so easy; though it is equally important from both a diagnostic and a therapeutic standpoint. Bloody urine varies from a smoky color to a brown or bright red color, and gives the reaction for albumin. Sometimes blood coagula are plainly present floating in the urine or settled at the bottom. Red blood corpuscles show under the microscope, and distinguish hematuria from hemoglobinuria in which condition they are absent. If under the microscope tube casts are also found, the hemorrhage is from the kidneys. Care should be taken that there is no admixture of menstrual blood in the specimen examined.

Tests for Blood in the Urine.—Other tests than the microscopical examination are rarely required.

The *guaiacum test* consists of the addition to the urine of a drop or two of tincture of guaiacum and two minims of ozonic ether. At the junction of the two fluids a blue line forms, which becomes diffused through the ether.

Heller's test for blood pigment consists in adding liquor potassæ, boiling the urine, and observing the flakes of precipitating phosphates, which become reddish-yellow or brown from the hematin crystals as they fall. Spectroscopic examination may reveal the single band of reduced hemoglobin or the double band of oxyhemoglobin.

In determining the source of the hemorrhage it is necessary in addition to the foregoing tests to take into consideration the color of the urine, the presence and shape of clots and the time at which the blood appears in the urine. If the blood be from the kidneys, it is thoroughly mixed with the urine, giving a uniform smoky, brown or red color, according to the quantity present. If in addition blood casts are also found, the diagnosis is made positive. If the blood be from the ureters, it is discharged in long "earthwormlike clots," and so appears in the urine. When hemorrhage from the ureters is secondary to renal hemorrhage, the ureters sometimes become blocked on the diseased side, during which time the urine passed is clear, sooner or later followed by the characteristic clots and this, by a renewal of the hemorrhages, which are bright red and of an irregular shape.

Blood, when from the bladder, is usually passed with the last portion of the urine. The blood and urine are not intimately mixed, and large clots settle on standing. If the bladder be washed out, the water comes away blood-tinged, whereas it would be clear if the hemorrhage were from the kidneys.

If the blood is from the urethra, it comes in advance of the urine or entirely independent of urination.

Treatment. — The treatment of hematuria depends largely upon the nature of the primary disease or causative conditions. The following remedies, as a rule, are most useful.

Aconite (2x). — Hematuria from inflammation of the urinary tract especially cystitis and urethritis. Urination painful, difficult, drop by drop; urine scanty, fiery, scalding hot, red or dark colored. Urine deposits blood.

Arnica (2x), when caused by external violence.

Arsenicum (3x). — Very painful urination, scanty secretion; burning pain in the urinary organs; paralytic symptoms of the bladder; great anguish and restlessness; especially in infectious and septic diseases.

Cannab. sat. (1x). — Hemorrhage, especially from the urethra, with inflammation. The urethral symptoms are very similar to those of Cantharis, the latter having more tenesmus, while under Cannabis there is more burning and smarting.

Cantharis (3x). — One of our most effective remedies, especially when violent inflammation is present. Violent cutting, pressing and crampy pains in the bladder, extending into the urethra and into the kidneys; strangury, burning pain before, during, and after urination. Urine red, as if mixed with blood, or dark colored.

Colchicum (2x). — Hematuria associated with rheumatism or valvular disease. Scanty discharge of dark, turbid urine, with tenesmus and burning. Dark, bloody urine, almost like ink, with strangury.

Crotalus (6x). — Hematuria in the course of low infectious diseases or septic states. Purpura. — Hemorrhages from all the orifices of the body.

Erigeron (Tincture). — A most valuable remedy for hemorrhage from any organ of the body. Is best used in tincture or oil, from one to five drops a dose, repeated according to necessity.

Hamamelis (Tincture). — Hematuria from passive congestion of the kidneys.

Hydrastinine hydrochlorate is said to be a very efficient remedy when given in the first trituration.

Ipecac (3x). — Not so useful as in other hemorrhages. May be

required when there is profuse bleeding, with fainting, deadly paleness, sickness of the stomach; oppression of the chest.

Lachesis (6.).—Often valuable for hematuria occurring during the course of low, infectious diseases, or septic conditions. The urine is foaming black or looks like coffee grounds.

Mer. cor. (3x).—Hematuria from nephritis. Violent cystic symptoms. Albumin and tube casts present.

Millefol. (1x).—Pain in the region of the kidneys, with chilliness, necessity to lie down; the blood forms a sediment in the vessel like a bloody cake, (Raue). Pressure pain in the urethra during the flow of blood.

Nitric acid (3x).—According to Goullon, specific in active hemorrhage, also after mercury.

Nux vomica (3x).—Hematuria after alcoholic excesses, highly seasoned foods, or strong medicines. From dyspepsia, with constipation; suppression of hemorrhoidal and menstrual discharges; full, tensive feeling, pressure, and distention in the abdomen, loins, and region of the kidneys.

Phosphorus (6x).—Decomposition of the blood; after sexual excesses; after poisoning with turpentine; hemophila; with acute pain in region of kidneys and liver, and jaundice.

Secale (3x).—Given by the old school hypodermatically in severe cases. Homœopathic to passive hemorrhage; painless discharge of thick, black blood in consequence of kidney disease; coldness of the body; cold perspiration on forehead; great weakness.

Terebinthina (1x).—This is probably the most useful and most often prescribed drug for hematuria. Its effects in renal cases as well as others is sometimes marvelous. The following indications, chiefly clinical, are given by Raue: “The blood is thoroughly mixed with the urine, forming a dirty, reddish-brown or blackish fluid, or a coffee-ground-like sediment; burning, drawing pains in the kidneys; pressure in the bladder, extending up into the kidneys when sitting, disappearing when walking about; before urination, pressing and straining in the bladder when sitting, passing off when walking; burning in the bladder, worse during micturition.

Hemoglobinuria.

Definition and Varieties.—The presence of hemoglobin, the red-coloring matter of the blood, in the urine, without the corpuscular elements, thus differing from hematuria. Two varieties are recognized: (1) Toxic; (2) Paroxysmal.

Pathology.—Whenever, from any cause, the red blood corpuscles

are dissolved in the blood, the coloring matter thus set free is excreted as methemoglobin in the urine, imparting to it a reddish-brown color which may in extreme cases resemble that of porter. The urine contains granular pigment and is albuminous, but usually no red blood corpuscles are present. If present, their number bears no proportion to the intensity of the color of the urine." (Lockwood.)

Etiology.—1. *Toxic.*— This variety is produced by toxic substances, which dissolve out the hemoglobin from the corpuscles. Such are sulphuretted hydrogen, arseniuretted hydrogen, carbon monoxide, carbolic acid, pyrogallie acid, naphthol, nitro-benzole, potassium chlorate in large doses, and the poison of certain mushrooms; also sometimes the poison of the infectious diseases, including scarlet fever, diphtheria, pyemia, yellow fever, typhoid fever, malaria, scurvy, purpura and syphilis. Hemoglobinuria sometimes follows extensive burns, and occurs after the transfusion of blood, especially the blood of animals into the human subject, and after extensive superficial burns; it is said also to occur after exposure to cold. An epidemic form of hemoglobinuria in the newborn has been described (Winckel's disease) characterized by jaundice, cyanosis and nervous symptoms.

2. *Paroxysmal.*— This variety is rare. The passage of hemoglobin occurs in paroxysms. Its causes are not definitely known. It is supposed to result from excessive muscular exertion especially when associated with cold, while cold itself is perhaps the most frequent of all causes. Mental emotion is sometimes a cause. It is sometimes present in Raynaud's disease and in syphilis. It occurs in connection with pernicious malarial poisoning, when it is known as *malignant malarial hemoglobinuria*. In Africa it is called *black-water fever*.

Symptoms.— In toxic hemoglobinuria the symptoms are usually those resulting from the causative condition or toxic agent. In the paroxysmal form the attacks come on suddenly, preceded by chills and fever, headache, and pain in the limbs, the temperature often reaching 104° F., though it is sometimes subnormal. The attack rarely persists for more than one day; it then subsides, and is followed by slight jaundice in a considerable number of cases. Urticaria after the paroxysm is not uncommon, and purpura and anemia have been observed.

Diagnosis.— The urine is of a reddish-brown color, turbid, and has a reddish-brown or brownish-black sediment. The reaction is usually acid, and the specific gravity slightly lowered. It is distinguished from hematuria by the absence of red blood corpuscles; but care should be taken not to mistake hemoglobinuria for bloody urine in which the corpuscles have been dissolved during ammoniacal decomposition. Small flakes or granules of disintegrated hemoglobin are found, and are

brownish-black in color. The urine reacts to Heller's test for blood pigment, described under Hematuria. The spectroscope shows the red, green and yellow absorption bands of methemoglobin.

Prognosis.—The prognosis depends entirely upon the amount of toxin present and the general character of the causative primary condition. Recovery is usual, but some cases, especially the malignant malarial, are rapidly fatal. The prognosis of the paroxysmal form is usually good, though it may continue to recur for a long time.

Treatment.—The treatment is entirely symptomatic, but has not proved very satisfactory. Rest and warmth are the most important essentials, especially during the attacks. Exposure to cold and severe exertion should be avoided. A warm climate is quite desirable. Alcoholic drinks and irritating foods are to be avoided.

Aside from the remedy that may be called for by the symptoms of the primary disease, I consider *Chin. ars.* (2x) the chief remedy. *Kali chlor.* (3x) and *Ferrum phos.* (3x) have given relief. Also consult the remedies for hematuria, especially *Arsen.* (3x), *Crotal.* (3x), *Lach.* (6), and *Terebin.* (1x). Dr. S. Jones suggests picric acid. As might be expected, the old school gives *Quinine* in malarial cases and *Potas. iod.* when there is a history of syphilis.

Pyuria.

Definition.—The presence of pus in the urine.

Etiology.—Pus in the urine results either from a suppurative inflammation in some portion of the genito-urinary tract—pyelitis, pyelonephritis, cystitis and urethritis—or, from the rupture of an adjacent abscess into the tract.

Diagnosis.—The urine is of a greenish yellow or yellowish white tinge. On settling there is a heavy grayish sediment, the supernatant fluid being usually turbid. The sediment is often tenacious and ropy. The presence of pus in the urine is easily demonstrated microscopically. Usually albumin is present, and if to any marked extent, it indicates renal disease, nephritis being positively present if tube casts are also discovered. "On the addition of liquor potassæ to urine containing pus, the latter is converted into a clear gelatinoid substance; mucus, on the other hand, becomes thin and flocculent. Mucus may also be distinguished from pus by its failure to react to cold nitric acid, while the albumin of purulent fluid coagulates." If the pus be due to pyelitis or pyelonephritis, it is uniformly mingled with the urine, and the condition of the urine is unchanged after the bladder has been washed out. The reaction is usually acid except when complicating cystitis, then it is usually alkaline. Large abscesses of the kidney may suddenly dis-

charge a large quantity of pus, and for days or weeks afterward the urine may be free.

If the pus be due to cystitis, we obtain characteristic vesical symptoms of that disease.

If the pus be due to urethritis it escapes in advance of, or with, the first portion of the urine, and can be squeezed out from the male urethra. Local symptoms of inflammation are usually evident, and this is ordinarily a history of gonorrheal infection.

Rupture of an abscess into the urinary passages is characterized by a sudden irruption of pus, which disappears as abruptly as it came on or lasts but a few days, lessening gradually until there is a complete cessation.

Treatment. — The treatment is that indicated by the causative disease.

Chyluria.

Definition. — The presence of chyle in the urine.

Etiology. — Chyluria may be of either parasitic or non-parasitic origin. The parasitic form is usually seen in the tropics, and is caused by engorgement and rupture of lymphatic vessels into the urinary passages, due to obstruction of the larger branches of the thoracic duct or of the duct itself, by the *filaria sanguinis hominis*. The non-parasitic form occurs occasionally in temperate regions. It is also due to some connection between the lymphatic vessels and the urinary passages, but the exact pathology is unknown. It is supposed to follow injuries or changes in the walls of the lymph vessels affecting their lumen. It is sometimes associated with pregnancy.

Diagnosis. — The urine is milky in appearance and contains emulsified fat and serum albumin. After standing for a time, a clot settles to the bottom or a creamy pellicle of fat rises to the surface. The microscope shows fine fat-globules which dissolve in ether.

Prognosis. — Intermittent attacks of chyluria, as they usually occur, are not incompatible with a long and comparatively healthy life, but bad habits, exposure and unfavorable hygienic surroundings favor the disease, and in inducing intercurrent troubles, especially of a pulmonary character, bring about a fatal termination. The disease is rarely, if ever, radically cured.

Treatment. — During the attacks, rest in the recumbent posture is desirable. Exposure to cold and severe exertion are to be avoided. Residence in a warm climate is desirable. *Phosphoric acid* is the only remedy where the pathogenesis seems to correspond. So far there have been no clinical verifications.

Glycosuria.

Definition.—The presence of sugar in the urine.

Etiology.—Diabetes Mellitus is the most frequent and important cause. Temporary glycosuria may be associated with certain infectious diseases, especially diphtheria, cholera, typhoid fever, and epidemic cerebro-spinal meningitis. It may result from such gastro-intestinal disorders as permit faulty digestion of sugar and starches, and functional disturbances of the liver. It may be caused by certain toxic agents such as carbon monoxide, morphine, hydrocyanic acid, amyl nitrite, curare, chloral, alcohol, mercury, arsenic, turpentine, phloridzin and various coal-tar derivatives, as salicylic acid and salol. It may result from nervous causes, as neuralgia, cerebral concussion, cerebral hemorrhage, excessive mental exertion and sudden mental emotions, such as fright, grief and worry. It is often present during pregnancy, and may be caused by obesity. It may result from pancreatic disease and from exophthalmic goitre. It sometimes occurs in gouty patients who have chronic diffuse nephritis. It sometimes follows the ingestion of a starchy or saccharine diet. Heredity is said to play an important part.

Tests for Sugar.—1. *Trommer's Test.*—Add to the urine a few drops of a solution of cupric sulphate, and then its own volume of liquor potassæ. If a bluish-white precipitate falls, either filter or agitate the liquid until it assumes a slight and uniform turbidity, then heat, and if sugar be present, a yellow or red deposit of cuprous oxide falls; .01 per cent of glucose may be detected in this way.

2. *Fehling's Test.*—For this test two solutions are required: (1) Dissolve 34.652 grammes of chemically pure crystallized sulphate of copper in 200 grammes of distilled water. (2) To 480 grammes of a solution of caustic acid (specific gravity, 1.14) add 173 grammes crystallized neutral sodic tartrate. These solutions should be slowly united and diluted to 1 liter. Place in a test tube a quantity of the test fluid and dilute with about four times its bulk of water. Boil for ten seconds, and if the fluid remains clear (if the solution does not remain clear, a fresh one should be prepared), add the urine in drops, when, if sugar is present, a yellowish precipitate is formed. If the yellow reaction does not promptly appear, the addition of more urine, with occasional reapplication of heat, may be continued until the amount of urine added equals the quantity of the test fluid. "Fehling's solution is so composed that if an equal bulk is exactly reduced by an equal bulk of urine, that urine contains half of one per cent of glucose; if by half bulk, one per cent; if twice the bulk, $\frac{1}{4}$ per cent, and so on, whence one can easily estimate roughly the percentage. Should the urine contain more than

one per cent of sugar, it should be diluted one to ten and the result multiplied by ten." (Tyson.)

3. *Böttger's Bismuth Test.* — If albumin is present, it must first be removed. Add to the urine half its volume of liquor potassæ, and then a little bismuth subnitrate, shake and thoroughly boil; the presence of sugar reduces the salt, and black metallic bismuth is deposited, or if but little sugar, a gray deposit occurs.

4. *Fermentation Test.* — This test is based upon the development of alcoholic fermentation by the addition of brewer's or compressed yeast, glucose being the only substance known to exist in urine, which will undergo such fermentation. It is performed by adding a small piece of compressed yeast to the urine in a test tube, inverting the latter in a dish of the same, and standing aside for twelve to twenty-four hours, the temperature being kept at about 80° to 100° F. The evolution of gas resulting from the fermentation of the sugar takes place, with a consequent reduction of the specific gravity of the urine. The yeast may be tested simultaneously for its purity and strength by placing one portion in a test tube containing about two-thirds mercury and filling with normal urine, and a similar portion in a second tube with mercury and a thin, watery solution of sugar or glucose; the fermentation test of the suspected urine may be made at the same time, and all three tubes inverted over a dish of mercury. The first tube should not show the presence of carbon dioxide, if the yeast was free from sugar; but the second tube should show this gas to be present, or the yeast was inert.

Lithuria.

Definition. — A condition marked by the persistent excess of uric (lithic) acid or its salts in the urine.

The amount of uric acid normally excreted each day varies according to the diet, being usually from ten to thirteen grains. Its relative proportion to urea being about one to thirty-three. We know very little as to its production, but it is supposed to originate in the liver, formed from ammonia and lactic acid. Anders says: "The evidence of recent experimentation is in favor of the view that uric acid is derived wholly, or almost wholly, from a metabolic solution of leukocytes and nuclear substances generally, and that uric-acid formation is not to be regarded as an 'unfinished product' in the old sense."

"The causes of lithuria, as seen in certain conditions in which this metabolic change occurs, may be put down to be chiefly as follows: (1) Lithemia (uricemia, uric or lithic acid, or gouty diathesis); (2) gout and rheumatism; (3) fever; (4) leukemia and pernicious anemia; (5) pul-

monary affections in which the interchange of gases is interfered with; (6) a highly nitrogenous diet."

Uric acid is eliminated chiefly as the urates of ammonium and sodium, and in less quantities as the urates of potassium, calcium and lithium. The uric acid separated from these bases gives the well-known characteristic "brick-dust" or "red-sand" sediment. According to Roberts the causes of the precipitation of the uric acid are: "(1) High acidity; (2) poverty in mineral salts; (3) low pigmentation; and (4) high percentage of uric acid." According to Osler, "The grade of acidity is probably the most important element."

The pinkish deposit so common in urine after it cools is due to the precipitation of amorphous phosphates. It is composed chiefly of the acid sodium urates, and occurs usually in urine that is highly concentrated, of high specific gravity, and of excessive acid reaction.

Haig has made some very important investigations regarding lithuria. Based on the pretty-well-established fact that the blood holds uric acid in solution through its alkalinity, he concludes that the excretion or the retention of uric acid can be regulated by increasing or diminishing the alkalinity of the blood. His theory is that agents increasing the alkalinity, finding a considerable quantity of uric acid in the liver, the spleen, and the tissues, render its solubility more perfect, so that it is taken into the blood and excreted by the kidneys. Sodium salicylate is the chief drug to cause an elimination of uric acid, and the acids are the most important in causing its retention. Haig further observes that drugs affect only the excretion of uric acid, and have no influence whatever upon its formation. See also article on Lithemia.

Oxaluria.

Definition.—A condition marked by the persistent excess of calcium oxalate in the urine.

Oxalate of lime is held in solution in the urine by the acid phosphate of soda. The crystals are readily recognized under the microscope. They are sometimes found in normal urine that has been standing for a long time, and occur after eating certain fruits and vegetables, as tomatoes, rhubarb, apples, pears and cauliflower.

"Oxaluria has been described by some English physicians as an independent disease or special diathesis in which marked dyspepsia and hypochondriasis or neurasthenia are associated. The condition is better explained, probably, as one of a disturbed metabolism—particularly of the fats and carbohydrates—in which the oxaluria and nervous symptoms are manifestations analogous to the lithuria and the irregular gouty symptoms of lithemia. Oxalates and lithates are not infrequently

found together in the urine of those subject to the gouty habit." (Anders.)

Oxaluria is present in chronic disease when there is great waste of tissue, as in tuberculosis and diabetes mellitus, and to a less extent in the cancerous cachexia. In rare cases it is also found in long-continued cases of spermatorrhea, in catarrhal jaundice, in mulberry calculi and in general paresis of the insane.

Phosphaturia.

Definition.—A persistent excess of phosphates in the urine. Phosphates occur in the urine as alkaline salts of sodium and potassium and as earthy salts of lime and magnesium. In urine undergoing ammoniacal fermentation the ammonio-magnesium salt or the triple phosphates may appear.

Phosphates are soluble only in neutral or acid urine, and are precipitated whenever the urine becomes alkaline. They are, therefore, produced by any cause that induces an alkaline fermentation. They are insoluble in water, freely soluble in acids, are precipitated by alkalis, and, when in alkaline urine, by heat. In making the heat test for albumin, phosphates may be precipitated and be mistaken for albumin, but the specimen readily clears up on the addition of acetic acid, which, added before boiling, prevents their precipitation.

Of the earthy phosphates the lime phosphates are more abundant than those of magnesium. They are found in cases of nervous or atonic dyspepsia, neurasthenia, melancholia, and other debilitated conditions. Whether or not a marked precipitate of phosphates means an excess to the detriment of nervous tissue alone has not been determined precisely as yet. Obviously, however, a certain portion of phosphates is supplied by food and the rest of the body, owing to defective assimilation and metabolism. (Anders.) Osler says: "It has long been thought that there is a relation between the activity of the nerve tissues and the output of phosphoric acid; but the question can not yet be considered settled." The amount of phosphates is increased in wasting diseases, such as phthisis, acute yellow atrophy of the liver, leukemia and severe anemia, and is diminished in acute diseases and during pregnancy. The so-called "phosphatic diabetes" is characterized by polyuria, excessive phosphaturia, thirst, emaciation and nervous disturbances. (Tessier.)

Other anomalies of the urine, but which are of such infrequent occurrence that they will not be discussed, are: Cystinuria, Peptonuria, Albumosuria, Leucinuria, Indicanuria, Lipuria, Urobilinuria, Acetonuria and Tyrosinuria. Choluria (bile pigment in the urine) is

but a condition and symptom of jaundice, and is considered under that heading.

UREMIA.

Definition.—A term applied to a combination of symptoms resulting from toxemia due to the retention in the blood of excrementitious substances normally excreted by the kidneys. The positive nature of the toxic substances producing uremia and the method of their action has never been determined.

Symptoms.—Uremia may be either acute or chronic, and affect particularly the cerebral, the respiratory or the gastro-intestinal systems. For this reason French writers classify the respective forms of manifestation as cerebral, dyspneic and gastro-intestinal.

Acute uremia usually comes on suddenly, but may be preceded by mild uremic symptoms such as headache, drowsiness, malaise, and restlessness. Sooner or later profound coma supervenes or more often epileptoid convulsions, followed rapidly by coma, dyspnea, feeble heart action, fever and pulmonary edema. Death occurs within a short time, usually inside of two or three days.

In chronic uremia only the milder symptoms above noted are manifest and these continue irregularly for a considerable length of time. The occasional attacks of drowsiness, feeble heart action and mild dyspnea, together with transient dimness of vision and muscular twitching, are usually sufficient to excite suspicion as to the nature of the causative disease. The patient after a varying length of time gradually passes into a comatose state from which he can not be aroused, and death soon follows. It is better, however, to discuss the general symptoms of the disease as a whole. Frequently it is impossible to strictly differentiate between acute and chronic cases.

Uremia is often preceded by headache, dizziness, nausea and vomiting. *Drowsiness* follows sooner or later, coming on suddenly or gradually and being slight or well pronounced, the patient passing into a state of partial or complete *coma*. Alternating with this condition are epileptoid *convulsions* (uremic eclampsia). There are at all times the most alarming and dangerous symptoms of Bright's disease. Sometimes the convulsions precede the coma, and may occur without the slightest warning, being the first symptom indicative of serious kidney lesion. Occasionally a single convulsion proves fatal, but more often there are frequent repetitions with intervening coma, death being more likely to occur during these intervals. The fits exhibit every degree of severity from the slightest twitchings to the most violent epileptiform spasm, distinct Jacksonian epilepsy sometimes occurring in its most

characteristic form. Following the convulsions there may be impairment of vision or actual blindness—uremic *amaurosis*. This may last for several days. It may usher in the attack without any previous motor disturbances. There are no ophthalmic changes, the condition being purely of centric origin. *Uremic deafness*, which is probably also of centric origin, occurs less frequently. The temperature during the convulsions is sometimes elevated, but is more often lowered, possibly sinking rapidly after the attack. The pulse is often slow before the appearance of severe symptoms, sometimes as infrequent as 40 to 50, but with severe symptoms it becomes rapid and feeble. The heart's action is labored and feeble. Other cerebral manifestations sometimes present are *mania* and *delusional insanity*; also rarely melancholia and paralysis, including hemiplegia and even monoplegia. These may occur independently of a convulsion or succeed it. True uremic palsies are of rare but undoubted occurrence.

Uremic dyspnea, sometimes termed renal asthma, is classified by Palmer Howard as follows: (1) Continuous dyspnea; (2) paroxysmal dyspnea; (3) both types alternating; and (4) Cheyne-Stokes breathing. The attacks of dyspnea most often occur in paroxysms during the night, but with more chronic cases may be more or less continuous for a long time. The Cheyne-Stokes breathing may persist for weeks, even without any manifestations of convulsive attacks or coma.

The gastro-intestinal symptoms of uremia may come on gradually, or set in suddenly with violent and persistent vomiting, frequently associated with violent hiccough and sometimes diarrhea. The diarrhea may exist without other gastro-intestinal symptoms. Both catarrhal and diphtheritic types of intestinal inflammation may be associated with this symptom. Barie describes a uremic stomatitis which is frequently seen. It is characterized by foul breath, and red, swollen and painful tongue, lips and gums.

Suppression of urine, an almost constant symptom, is often the initial one which should at once excite suspicion. Accompanying it is often a breath of urinous odor, and when vomiting accompanies scanty or suppressed urine, the vomited matters sometimes have a urinous odor. The urine is generally highly albuminous and deficient in urea.

A *cutaneous erythema* with much itching is sometimes present. Often there are profuse sweats, and sometimes urea may be excreted by the sweat glands and appearing as an accumulation of glistening scales or crystals upon the skin.

Diagnosis.—Where the nephritic origin of uremia has not been recognized in chronic cases, the condition may pass unsuspected for a long time. In acute cases, the manifestations are more characteristic

and the nature of the causative condition is more readily recognized. Usually, the presence of edema and an albuminous urine, with tube casts, is sufficient, with the general symptoms, to establish a clear diagnosis.

Uremic coma, especially when occurring suddenly, as is common in chronic interstitial nephritis, may be confounded with *alcoholism*, *cerebral hemorrhage (apoplexy)*, *cerebral tumor*, or *meningitis*. The points of dissimilarity between the first two conditions and uremia are tabulated by Anders (after Herrick):

Cerebral Hemorrhage.	Alcoholic Narcosis.	Uremia.
Pupils unequal or dilated.	Pupils contracted or dilated; eyes injected.	Pupils generally dilated; albumin-uric retinitis.
Stertorous, puffy breathing, and flapping cheek.	No sterotorous breathing.	Sharp, hissing sterotor.
No odor.	Odor of alcohol.	No odor, unless urinous.
Paralysis; hemiplegia.	No paralysis, usually.	No paralysis.
Unconsciousness absolute.	May be aroused.	May or may not be aroused.
Pulse slow and strong, or irregular; arteries often atheromatous.	Pulse frequent and feeble.	Pulse at first strong, later weak and rapid; tension strong; arteriosclerosis.
Coma sudden and deep.	Coma gradual.	Coma gradual or sudden.
Convulsions late; may be unilateral.	No convulsions.	Preceded by general convulsions, headache, etc.
Urine generally negative.	Urine generally negative.	Urine albuminous.
Apoplectic habit; heart may show hypertrophy.	Red face and nose, heart often weak, dilated, myocarditic.	Edema and pallor; heart hypertrophied.

In opium poisoning, the slow and sterotorous respiration is diagnostic, the pupils are contracted and do not respond to light, and the coma is not so absolutely profound, the patient being easily partially aroused, but sinking back again into a somnolent state. Meningitis, if associated with a slight degree of fever and coma, without marked localizing symptoms, may be mistaken for uremia, but usually the character of the delirium, the rigidity of the neck, and the high fever will exclude that condition. Persistent uremia may occur in the course of acute infectious diseases and pass unrecognized, without a careful chemical and microscopical examination of the urine, which, indeed,

should never be omitted in any case where there is the slightest reason to apprehend any kidney lesion.

Prognosis. — The prognosis is always grave, but depends largely upon the nature of the cause. Those cases occurring from chronic interstitial nephritis offer the most hopeless prognosis; in cases caused by conditions other than nephritis, the prognosis depends entirely upon the removability of the cause.

Treatment. — Acute uremia requires the adoption of prompt and energetic measures for the elimination of the poison and the relief of the convulsions. Nitro-glycerine $\frac{1}{100}$ should be given every half hour. The colon should be irrigated with hot water, and hot fomentations applied to the loins. Purging should be induced by the use of a hot concentrated solution of the sulphate of soda, or by two-grain doses of elaterium. For the convulsions, inhalations of chloroform are most effective. Chloral hydrate may also be used, either by mouth or rectum. I always prefer the latter method, using about one dram in two ounces of water at each injection. For uremic vomiting, Laidlaw recommends half-drop doses of Iodine tincture, or drop doses of a one to ten watery solution of the hypochlorite of lime; and for uremic headache, nitro-glycerine $\frac{1}{100}$, or hypochlorite of lime solution, five drops four times a day. The further treatment of uremia will be included in that of acute and chronic nephritis.

CONGESTION OF THE KIDNEYS.

Synonyms. — Renal Hyperemia, Catarrhal Nephritis.

Definition. — An increase in the amount of blood in the vessels of the kidneys; when arterial, it is termed active or acute congestion; when venous, passive or chronic congestion.

Pathology. — *Active* or *acute* congestion consists in a temporary engorgement of the arteries, the kidney being swollen, and deep red in color. On section the cortex is wider and darker than in health, the blood vessels over-full, the Malpighian bodies distended, the cells the seat of cloudy swelling.

Passive or *chronic* congestion. — The kidney is hard, firm, and bluish-red as to its external surface. In the earlier stages it is enlarged simply from the presence of the large amount of blood detained in its vessels. The stellate veins are unusually distinct.

The capsule is not adherent; the surface is smooth. This condition may be associated with a collection of milky fluid in the left pleural sac when there is thrombosis of the subclavian vein at the point at which the thoracic duct enters. The term *ascites adiposus* is applied to a milky fluid in the peritoneal sac which shows the presence of large and small fat-globules to the exclusion of other morphologic elements.

A considerable number of the glomeruli are large, their capillaries are dilated, and the cells covering the capillaries are swollen. Aside from a slight increase in the subcapsular connective tissue, the stroma is unchanged. In the later stages there is an increase of the connective tissue, with consequent induration, cyanotic induration, and contraction results, or a form of chronic Bright's disease.

Etiology.—*Active* congestion may be caused by exposure to cold when overheated, or by injuries to or over the kidney. Removal of one kidney may produce congestion in the other. It may follow the elimination by the kidneys of certain poisons, as especially turpentine and cantharides. It occurs during infectious fevers, especially the eruptive fevers. It is identical with the first stage of acute nephritis, however caused, and when prolonged passes into that condition.

Passive congestion is caused by any agency which obstructs the movement of the blood through the kidney. This may occur from pressure on the renal veins by tumors, the pregnant uterus, or ascitic fluid, but more often the venous engorgement is due to chronic cardiac, pulmonary or hepatic disease. It is oftenest found in valvular disease of the heart and chronic pulmonary disease involving considerable areas of the lung, such as emphysema, interstitial pneumonia, and pleurisy, with extensive effusion or marked adhesions. The "*cardiac kidney*" is the commonest variety.

Symptoms.—In active congestion there may be pain over kidneys and following the course of the ureters into the testicles and penis, irritable bladder, almost constant and pressing desire for urination, the urine scanty, highly colored and occasionally bloody, or it may be altogether suppressed. The urine is of high specific gravity, and may contain some albumin and casts. The temperature and pulse may be slightly elevated. The symptoms may continue for a few days with considerable prostration, and may then disappear, or continuing, pass into those of nephritis.

After nephrectomy, surgical operations upon the bladder, or in cases produced by the impaction of a calculus, and especially in the aged or feeble, the patient becomes exhausted, passes into a typhoid state with delirium, and dies.

In passive congestion the symptoms are at first chiefly those of the primary disease, generally cardiac or pulmonary. Later dropsy and scanty, high-colored, albuminous urine are observed. The urine is of high specific gravity, and contains a few hyaline casts. Sometimes albumin and casts are both absent. Urates may be deposited when the urine stands, which should excite suspicion, and lead to a careful examination of the heart and lungs. Dropsy first occurs as an edema of the lower extremities. Later there may occur effusions into the pleural

sac and peritoneum, and the hands and arms may be involved. Uremia rarely occurs, and very rarely is an interstitial nephritis produced.

Prognosis.— In ordinary acute cases the prognosis under proper treatment is favorable. If resulting from surgical operations or irritating poisons, and when occurring in feeble persons, nephritis may develop. The prognosis in passive congestion depends entirely upon the cause and its curability. Often the disease is temporarily controlled and apparently overcome by proper treatment. The dropsy diminishes or passes away entirely, albumin and casts disappear, and the patient is greatly relieved. At the same time the primary lesion remains, and may upon the slightest provocation re-excite all the symptoms.

Treatment.— Absolute rest, liquid diet, plenty of pure water to drink, and baths with friction of the skin are essential in all cases whether acute or chronic. Chronic cases may have solid food, but it must be light and easily assimilable. Otherwise the treatment is that of the causative disease. The medicinal treatment will be included in that recommended for acute and chronic nephritis.

ACUTE NEPHRITIS.

Synonyms.— Acute Bright's Disease, Acute Diffuse Nephritis, Acute Parenchymatous Nephritis. Exudative, Catarrhal, Tubal, Desquamative and Glomerulo-nephritis.

Definition.— An acute inflammation of the kidney, the tubular, vascular and interstitial tissues being simultaneously affected in different degrees in different cases, being either mild, severe or grave in character. Delafield recognizes three varieties under the common term of acute Bright's disease, as follows:— (1) *Acute degeneration of the kidneys*, (2) *Acute exudative nephritis*, and (3) *Acute productive nephritis*. Such a division is of no practical value.

Pathology.— The anatomic changes in, and the appearance of, the kidneys vary with the stage of the disease as well as its severity. In the first place, as ordinarily caused, it is symmetrical, both organs being alike involved. The alterations may be so trifling as not to be recognizable by the naked eye. As a rule, however, the organs are slightly enlarged, swollen and somewhat softened. These conditions are more evident when the interstitial exudation is abundant, and when inflammatory edema is evident. The capsules are not adherent; the surfaces are smooth; the cortex is usually thickened, and it may be either pale and mottled or congested, while the pyramids show an intense redness. The histology is summarized by Osler as follows: “(a) Glomerular changes. In a majority of the cases of nephritis due

to toxic agents, which reach the kidney through the blood vessels, the tufts suffer first, and there is either an acute intracapillary glomerulitis, in which the capillaries become filled with cells and thrombi, or involvement of the epithelium of the tuft and of Bowman's capsule, the cavity of which contains leukocytes and red blood corpuscles. Hyaline degeneration of the contents, and of the walls of the capillaries of the tufts is an extremely common event. These processes are perhaps best marked in scarlatinal nephritis. There may be proliferation about Bowman's capsule. These changes interfere with the circulation in the tufts, and seriously influence the nutrition of the tubular structures beyond them.

“(b) The alterations in the tubular epithelium consist in cloudy swelling, fatty change, and hyaline degeneration. In the convoluted tubules, the accumulation of altered cells with leukocytes and blood corpuscles causes the enlargement and swelling of the organ. The epithelial cells lose their striation, the nuclei are obscured, and hyaline droplets often accumulate in them.

“(c) Interstitial changes. In the milder forms a simple inflammatory exudate—serum mixed with leukocytes and red blood corpuscles—exists between the tubules. In severer cases, areas of small-celled infiltration occur about the capsules and between the convoluted tubes. These changes may be widespread and uniform throughout the organs, or more intense in certain regions.”

Etiology.—One of the chief causes of acute nephritis is exposure to cold and wet, especially when such exposure takes place while the individual is on a spree or is just sobering up. The habitual use of alcoholic liquors predisposes to acute nephritis. The next most frequent cause is the poison of infectious diseases, especially scarlet fever, in which acute nephritis may supervene as early as the tenth day, but usually not until the end of the second or third week. Other infectious diseases, as smallpox, acute endocarditis and acute articular rheumatism, typhus and typhoid fevers, acute lobar pneumonia, malaria, yellow fever, are also occasional causes. Measles, erysipelas, pyemia, jaundice and diabetes have been known to cause it; also tuberculosis; rarely syphilis. It may also occur in septicemia. Skin diseases, as well as extensive burns of the skin, are acknowledged causes; the former rarely, but the latter almost always if the burns be sufficiently extensive. Pregnancy is sometimes a cause, occurring usually in primiparæ and during the last months of pregnancy. Most cases of puerperal convulsions are due to acute nephritis. The disease is also caused by certain mineral and vegetable poisons, such as arsenic, mercury, lead, phosphorus and the mineral acids, and cantharides, turpentine and

carbolic acid. Very large quantities of alcohol when swallowed, have caused acute nephritis. Lastly acute nephritis may occur as a primary disease without any assignable cause. It occurs more in males than in females, and in young adults. Cases secondary to scarlet fever are, of course, most common in children.

Symptoms.—The mode of onset of acute nephritis is not always the same, but generally is very sudden. Among the symptoms earliest noticed is slight edematous swelling or puffiness in the face, below the eyes. In many cases this edema is preceded by chilliness, fever with nausea and violent and persistent vomiting, dull pain over the kidneys, following the ureters; frequent desire to urinate, and diarrhea; the skin may be harsh and dry and the pulse quick, tense and full. There is an exaggerated heart action or hypertrophy of the left ventricle. Anemia is an early and marked symptom. Twitchings or even convulsions may be present from the first. Other uremic symptoms may also become manifest. The edema rapidly extends to the upper extremities and trunk, and thence, if the disease does not abate, into the lower extremities and abdominal walls. In the male, the scrotum and the prepuce, and in the female, the labia are favorite seats of swelling. The great serous sacs are the last to fill with fluid in acute nephritis, although in bad cases ascites not unfrequently occurs, while there may also be transudation into the pleural and pericardial cavities. In marked cases the whole body becomes edematous and pits on pressure. Edema is most decided in cases following scarlet fever. After the other infectious diseases, it is frequently absent. Uremic symptoms are also more marked in scarlatinal cases. Cases sometimes develop gradually in children with but slight or transient edema and symptoms pointing rather to digestive or cerebral disease.

Changes in the Urine. — *A diminution in the quantity and alteration in the quality of the urine.* The former may amount to actual suppression. The urine is smoky or bloody in color, and contains albumin and casts in considerable quantities, with renal epithelium, blood corpuscles, granular fatty cells, and sometimes with pus cells. The *specific gravity is increased to 1025 or more, early in the case; later it may be as low as 1010 or 1015.* The total excretion of urea is reduced, though the percentage is high.

Diagnosis. — A positive diagnosis can only be made from both a chemical and microscopical examination of the urine, and this should never be omitted when there is a waxy skin and even slight puffiness of the eyelids. In cases of pregnancy, the urine should be examined frequently during the last months, as in this way only can puerperal eclampsia be anticipated and possibly prevented. Usually acute

nephritis is readily recognized. The suddenness of the attack, the scanty and bloody urine with its high specific gravity, the copious albuminuria, the blood and epithelial and dark granular casts, the blood corpuscles, free epithelium and granular fatty cells in the urine, — these are a combination of symptoms which can scarcely be mistaken. The special character of casts to be found may indicate the particular form of acute nephritis, but are of no practical clinical value.

It must not be forgotten that mild cases of albuminuria occur from various causes. In such, casts are absent and the condition is not a true nephritis.

Prognosis. — While in general the prognosis is grave, nevertheless, under prompt and efficient treatment a very large percentage of cases recover. Much depends upon the nature of the primary disease. Most cases of the diffuse form following scarlet fever die, or chronic nephritis follows with a subsequent fatal termination. Cases occurring from cold or exposure offer the most favorable prognosis. The duration of acute nephritis varies from a few days to five or six weeks. The former terminate fatally, four weeks or more being required for the recovery of favorable cases. In the latter the albuminuria gradually decreases, and with the casts finally disappears, while the daily quantity of lighter urine increases. The longer the duration of the case the less hope there is of recovery. Suppression of the urine is the most unfavorable symptom, uremia coming next in importance. Pulmonary edema is a not infrequent cause of sudden death, which latter may also occur from other causes, a point that should not be forgotten.

Treatment. — Rest, quiet and warmth are the primary essentials. The patient should be kept in bed in a warm room, between flannel blankets, and should be clad in thin Canton flannel. No cases are so mild that these measures are unnecessary. The diet should be of bland liquids only, avoiding meat and meat broths. Milk is the best food, but buttermilk and gruels may be allowed; also kumyss, arrow-root, rice, vegetable soup (avoiding onions) and grape juice. The patient should drink freely of plain, distilled or carbonated waters or lemonade. Hot drinks are particularly beneficial. Later in the disease animal broths may be allowed. The bowels must be kept free, even if laxative waters are required for that purpose. Next in importance is to excite and keep up a free action of the perspiratory glands, and thus relieve the congestion of the kidneys, and free the system of that which the kidneys in their congested state are unable to do. For this purpose the hot pack is the best. It is applied by wringing a blanket out of hot water, wrapping the patient in it, and then in a dry blanket, and finally a rubber-cloth cover surrounding all. The sweating thus

brought about should be allowed to continue about an hour, after which the patient is wiped carefully, and placed between dry blankets. In children often the hot bath is fully as efficacious and more convenient. The patient should be immersed in moderately hot water for fifteen or twenty minutes and then lightly dried and placed in bed between blankets. During and after these treatments, especially when being removed from the pack or bath, the greatest care must be exercised that no cold or draft of air is encountered. If for any reason hot air is preferred to the wet pack or bath, it can be generated by an alcohol lamp alongside the bed, and carried under the bedclothes by means of a funnel or rubber tube. For such purposes I always use the "Triumph" hot-air apparatus, which is exceedingly convenient and easily operated.

Goodno says, "Free sweating is to be carefully avoided in all stages, as it results in a relative increase of the excrementitious matters in the blood," but with this my own experience and that of most writers do not agree. Sweating should be encouraged during the above treatment by drinking freely of hot lemonade. In severe cases, if *Aconite* or other indicated remedy, together with this treatment does not produce results, it may be necessary to administer *Jaborandi* in drop doses of the tincture or *Pilocarpin* (2x) every two hours. The tincture of *Sambucus niger* is also valuable in such cases—ten to fifteen drops every hour. An infusion of the flowers, drunk hot, is often more effectual. (Hale.) In extreme cases it may be necessary to administer a hydrogogue cathartic. *Elaterium* is probably the best. When the heart's action is weak great caution should be used in the employment of such depleting agents. Dry cupping over the kidneys is recommended, and seems to have been of some benefit. During convalescence great care must be exercised to prevent the patient from taking cold, and the return to a semisolid and nitrogenous diet must be very gradual. Often at this time a change to a warm, equable climate is of great benefit.

Therapeutics.—**Apis** (3x).—Contrary to some authors I look upon Apis as the most often indicated and most useful remedy we have in a typical case of acute nephritis, though I admit its inefficiency in the gravest forms of the disease. The pathogenesis of Apis presents almost a perfect picture of the affection. Edema is the great clinical keynote of the drug, and when we add to that a whitish waxen, transparent appearance of the skin, absence of thirst, scanty urination and a highly albuminous urine containing tube casts, it would seem impossible to have a case of acute nephritis more clearly depicted.

Aconite (1x) is often indicated in the early stage, not only as might be expected, when resulting from exposure to cold and damp, but also, though perhaps in a less degree, in cases secondary to scarlet fever. The chief indications are high temperature, full, rapid pulse, dry skin, great restlessness, dark, scanty urine.

Belladonna (2x) may be useful in the early stages if its characteristic cerebral symptoms are present with flushed face, throbbing carotids and bounding pulse. The skin is not dry as in Aconite, but is moist; and steams when the bedclothes are raised.

Verat. vir. (1x) is often useful when there is high arterial tension, incompressible pulse, rapidly rising temperature.

Cantharis (3x) may be indicated not only when there is painful urination but also without that characteristic condition when the urine is dark and scanty, containing tube casts and blood; uremic symptoms. May be useful in all classes of cases, but particularly so after burns. Goodno says, "It presents in its symptomatology and pathological developments all of the essential features of diffuse nephritis." He prefers drop doses of the tincture from three to six or eight times in twenty-four hours. I have never had occasion to use other than the 2x or 3x dil. repeated hourly.

Terebinthina (2x) is one of our most effective remedies. It is said to be particularly useful in cases secondary to infectious diseases. Hughes considers it more useful in nephritis dependent upon cold. There is always burning, drawing pains in region of kidneys with heaviness and pressure; strangury, and scanty, albuminous, bloody urine; general edema; suppressed urine. Hughes considers its special action to be upon the circulation of the kidneys, and that scanty, bloody, albuminous urine is the special indication, it being less suitable to cases tending to uremia. Baehr recommends its use in the first (parenchymatous), perhaps in the second (amyloid), stage, but not in the third (cirrhotic) stage. "The first effect of Terebinthina is to render the urine clearer and more abundant, and to diminish the dropsy, to free the Malpighian capillaries of their congestive torpor, so that the watery portion of the urine is secreted freely, and the renal tubes, in consequence, are freed of the débris which obstructs them, and rendered capable of performing their functions."

Rhus tox. (3x).—Goodno has found this remedy useful after the subsidence of the initial hyperemia in cases not marked by dropsy. The specific action of this remedy upon epithelial surfaces and upon connective tissue led to its use. In idiopathic nephritis clearly attributable to exposure to cold and damp, especially when brought on by getting wet during a cold rain, in nephritis ushered in by much pain in

the back and general soreness or aching, and also in some cases following upon scarlatina without these indicating conditions, rhus has shown a marked ability to control the disease." He recommends drop doses of the tincture hourly. I have obtained excellent results in similar cases with the lower dilutions.

Cuprum ars. (3x). — I have had no experience with this drug in nephritis. Goodno recommends it when uremic symptoms develop. He gives the 2x or 3x trituration, "repeating three-grain powders every one-half to two hours until the symptoms subside. This remedy possesses a most remarkable influence over uremic convulsions, as I have determined during the past year. In quite a number of typical cases, some of which have been observed by other practitioners to whom I have suggested its employment, its use has been followed by disappearance of the convulsions within a few hours, and this, too, in some hopeless cases of chronic interstitial nephritis. The improvement has been manifested within two to four hours in most of these cases."

Merc. cor. (3x). — This drug is often effective in the early stages of acute nephritis. Urine scanty and albuminous with violent cystic symptoms; diarrhea with much colic and tenesmus; great dyspnea; puffiness of face and feet. J. H. McClelland, in "Arndt's System of Medicine," says, "This is one of the great remedies in acute tubal nephritis, having proved curative in the hands of the writer in many cases. Cases of poisoning by this drug show the kidneys to be injected and inflamed, especially the glomeruli. Many of the lesions of the kidneys which are found in cases of chronic poisoning are analogous to those of parenchymatous nephritis, such as increase in size, destruction of the epithelium, and plastic exudation." By some this drug is placed at the head of the list for acute nephritis, but I have never obtained satisfactory results from its use, notwithstanding its pathogenesis seems to present a fair picture of the disease. It is most useful when pulmonary edema is present.

Phosphorus (3x) is another remedy presenting an excellent picture of nephritis in its poisonings and provings. It is frequently useful when the urine contains epithelial, fatty or waxy casts, especially with the characteristic degenerative heart changes, pulmonary engorgement and edema. Baehr recommends Phosphorus for the whole course of the disease, for post-scarlatinal nephritis, and when depending upon suppurations of bones or associated with pneumonia, malignant pulmonary catarrh, or edema pulmonum. It is also beneficial for the amaurotic conditions incident to Bright's disease. A profuse watery debilitating diarrhea, the existence of tuberculosis,

ulceration of bones, and diseases of the right heart and the pulmonary artery, a condition of general atrophy and nervous exhaustion are additional indications. (McClelland.)

Digitalis (1x) is of great value when its characteristic cardiac complications are present. See Valvular Disease.

Convallaria (1x) is another remedy indicated mostly by the cardiac complications, but otherwise of little value. Consult also Apocynum (Tincture), Aurum (6x), Benzoic acid (2x), Colchic. (1x), Crotalus (6x), Cuprum (3x), Glonoine (3x), Opium (6x), Plumbum (6x), Merc. sol. (3x), Nux vomica (3x).

CHRONIC BRIGHT'S DISEASE.

Chronic Bright's Disease is always a diffuse process involving the epithelial, interstitial and glomerular tissues. Clinically two forms are recognized, one with and one without exudation from the blood vessels, though practically the same lesions are found in both. The exudative form is that known from a pathologic standpoint as the large white kidney, and the non-exudative form as the primary or genuine contracted kidney in contradistinction from the secondary contracted kidney, which is considered as a shrinking in the later stages of the large white kidney.

Amyloid degeneration of the kidney has been described as a variety of Chronic Bright's Disease, but this degeneration may attend any form of nephritis.

Chronic Exudative Nephritis.

Synonyms.—Chronic Bright's Disease, Chronic Parenchymatous Nephritis, Chronic Productive Nephritis, Chronic Croupous Nephritis, Chronic Diffuse Nephritis with Exudation, Chronic Tubal and Chronic Desquamative Nephritis, Chronic Glomerulo-nephritis, Large White Kidney, Secondary or Fatty and Contracted Kidney.

Definition.—A chronic diffuse inflammation of the kidney involving the epithelium, glomeruli, and interstitial tissue, and attended with exudation from the blood vessels.

Pathology.—“Several varieties of this form have been recognized. The most common is the *large white kidney* of Wilks, in which the organ is enlarged, the capsule is thin, and the surface white with the stellate veins injected. On section the cortex is swollen and yellowish-white in color, and often presents opaque areas. The pyramids may be deeply congested. On microscopical examination it is seen that the epithelium is granular and fatty, and the tubules of the cortex are distended, and contain tube casts. Hyaline changes are also present

in the epithelial cells. The glomeruli are large, the capsules thickened, the capillaries show hyaline changes, and the epithelium of the tuft and of the capsule is extensively altered. The interstitial tissue is everywhere increased, though not to an extreme degree.

"The second variety of this form results from the gradual increase in the connective tissue and the subsequent shrinkage, forming what is called the *small white kidney* or the *pale granular kidney*. It is doubtful whether this is always preceded by the large white kidney. Some observers hold that it may be a primary independent form. The capsule is thickened and the surface is rough and granular. On section the resistance is greatly increased, the cortex is reduced, and presents numerous opaque white or whitish-yellow foci, consisting of accumulations of fatty epithelium in the convoluted tubules. This combination of contracted kidney with the areas of marked fatty degeneration has given the name of *small granular, fatty kidney* to this form. The interstitial changes are marked, many of the glomeruli are destroyed, the degeneration of epithelium in the convoluted tubules is wide spread, and the arteries are greatly thickened.

"Belonging to this chronic tubal nephritis is a variety known as the *chronic hemorrhagic nephritis*, in which the organs are enlarged, yellowish-white in color, and in the cortex are many brownish-red areas, due to hemorrhage into and above the tubes. In other respects the changes are identical with those in the large white kidney.

"Of changes in the other organs the most marked are thickening of the blood vessels and hypertrophy of the left heart." (Osler.)

Etiology.—This variety of chronic nephritis is a disease of young adults, rarely occurring after the fortieth year, and is somewhat more common in males than in females. It may follow acute diffuse nephritis, whether arising from cold, from scarlet fever, or from pregnancy, and it occurs after chronic congestion and chronic degeneration of the kidney. In most instances it arises insidiously, in a subacute manner and without any previous acute manifestation. The excessive use of malt and alcoholic liquors predisposes to the disease. Habitual exposure to cold and dampness, such as residence in damp, cold houses, seems to cause the disease. Great stress is laid by German writers upon malarial poisoning as a cause. In this country it is not a frequent cause, although the disease seems more prevalent in marshy and malarial districts. "It is not improbable that some toxic or infectious agency, acting slowly and persistently, may in the insidious cases be the cause of the nephritis, although manifestations elsewhere may be absent." (Anders.)

Symptoms.—There are few distinctive symptoms of chronic

exudative nephritis. If it follows acute nephritis the symptoms that have been manifested during the course of the latter will usually continue more or less in a modified form. Particularly is this true of the anemia, dropsy and albuminuria. In most cases, however, the disease begins insidiously, and, after a variable period of indescribable ill health, including digestive derangements and loss of strength, there develops an anemic, waxy appearance, with puffiness of the face and swelling of the feet. Ultimately the anasarca may become general, involving the face, hands, feet, legs, thighs and trunk. The serous sacs also frequently contain fluid, almost always in severe cases, but this is not invariably the case. It may be confined to the extremities, or to the face, and may even be confined to more unusual situations, as the scrotum. Dropsy is sometimes entirely absent, especially in the hemorrhagic variety. The general anasarca, together with the pallid, waxy complexion, are especially characteristic of chronic exudative nephritis, and are often of themselves sufficient to suggest the disease. The dropsy may continue in a moderate degree for months, and then gradually increase, death occurring in a few weeks. If the serous sacs become involved, the attendant symptoms are often distressing, and edema of the larynx, or pulmonary edema, or both, may develop suddenly, and cause a rapidly fatal termination. Dyspnea is a nearly constant symptom. It may be due to general weakness, but if severe, may be the result of hydrothorax, edema of the lungs, failure of the heart, or to contraction of the arteries. The pulse usually shows an increased tension, but not always. There may be hypertrophy or dilatation of the left ventricle, myocarditis, or feeble heart. Uremic symptoms, either acute or chronic in their character, may be present, but these are more characteristic of the non-exudative variety, uremic convulsions being of exceedingly rare occurrence. Chronic uremic symptoms, such as headache, sleeplessness, loss of appetite, nausea and vomiting, diarrhea, delirium and stupor, are common toward the close of the disease. Neuro-retinitis and nephritic retinitis are not as common as in the cases without exudation.

The Urine.—The quantity of urine is variable. It is usually diminished with increased specific gravity, but not always. The specific gravity, as a rule, slowly diminishes, varying usually between 1001 and 1012. It is often turbid, reddish-yellow, and sometimes of a smoky color, is highly albuminous, and deposits often, but not always, a bulky, cloudy sediment in which are found numerous tube casts of various forms and sizes, hyaline, both large and small, epithelial, granular and fatty casts. Leukocytes are abundant; red blood corpuscles are frequently met with, and epithelium from the kidneys and pelvis. The

amount of albumin varies from one fourth to three fourths in bulk of the urine tested. Both albumin and casts are increased during acute exacerbations, and at other times, when the lesion is quiescent, they may diminish, and may even disappear for short periods. The normal constituents of the urine are generally diminished in quantity. The most important of these is urea. To the reduced amount of solids, and particularly of urea, the reduced specific gravity is due.

The *course* of the disease is exceedingly variable. In some cases the disease progresses continually, and the patient dies from chronic uremia or dropsy in from one to two years. Some patients live for years with only pallor of the skin and albumin in the urine, feeling well otherwise. In some cases the attacks come on at intervals of several weeks or months, meanwhile the patient feeling well, though albumin is found in the urine. Other variations are also found. The usual duration of the disease is from one to three years. Tyson reports a case under observation, in which the disease has already existed twelve years.

Diagnosis.—The diagnosis of chronic Bright's disease is usually an easy matter. The waxy pallor of the patient, the general edema, the excessive amount of albumin in the urine, together with tube casts, epithelial, granular and fatty casts, are sufficient to establish the presence of chronic exudative nephritis. If there is an antecedent history of scarlatina or exposure to cold, pregnancy, or long exposure, the diagnosis is positive. It is often impossible to decide as to which form of the disease is present, or to distinguish chronic Bright's disease from amyloid kidney. Sometimes the two coexist, either as the result of the same cause, or the amyloid disease may be the result of long-continued parenchymatous nephritis. It is often impossible to distinguish the secondary stage of contraction unless the case has been for some time under observation, and we are able to trace its continuous course from the first.

Chronic parenchymatous is distinguished from chronic interstitial nephritis by the following points of difference according to Anders:—

Chronic Parenchymatous Nephritis.

Occurs in early or middle life.

There is a previous history of an acute attack of scarlet fever, or perhaps of acute alcoholism.

The onset is gradual, or markedly manifest.

Dropsy is a constant symptom.

Chronic Interstitial Nephritis.

Occurs later in life.

A previous history of gout, chronic lead-poisoning, syphilis, excessive eating and drinking (spirits), nerve strain; otherwise, often negative.

The onset is very slow, insidious, and indefinite.

Dropsy is rare.

Vascular changes and cerebral symptoms are comparatively uncommon.

Marked albuminuria, with tube casts.

Urine but little increased in quantity, often diminished; specific gravity is increased, or slightly diminished.

Anemia occurs earlier, and is more distinct.

Uremic symptoms are generally less severe—amaurosis, vomiting, diarrhea, headache.

Runs a shorter course—from two to six or seven years.

Arterio-sclerosis, cardiac hypertrophy and cerebral symptoms are common.

Very slight albuminuria, and few casts.

Urine of low specific gravity, and excessive in quantity.

Anemia slowly progressive and less marked.

Uremic symptoms are generally severe—coma and convulsions, great dyspnea.

Has a more chronic course—seven to thirty years.

Prognosis.—The prognosis is unfavorable, so far as recovery is concerned. Many cases, however, may be very much prolonged by treatment, and, if prolonged to the stage of contraction, the patient may be tolerably comfortable for a long time. But, sooner or later, the dropsy returns, the heart fails, and the patient dies of exhaustion, or some complication, or an attack of uremia intervenes to carry him off. In children that have had scarlet fever, recovery takes place in about two thirds of the cases, when properly treated, and some even after the disease has existed for one or two years; but, even in apparently favorable cases, relapses or heart failure may occur.

Treatment.—In general, the indications for treatment are about the same as have already been recommended for acute nephritis. Rest in bed, warmth, proper diet and hot baths are the most important essentials to be considered, and for the details of which the reader is referred to the article on acute nephritis. The diet is particularly important, though there is much difference of opinion as to its proper character. Some adhere rigidly to the milk diet; others recommend a nitrogenous diet exclusively. I think the latter is not to be considered. If there is but little dropsy, solid food may be allowed, especially white meats, vegetables and fruits, and at the same time an outdoor life and moderate exercise should be recommended. However, in most cases, the milk diet or buttermilk should be depended on as much as possible. Articles of food to be especially avoided are: onions, tomatoes and rhubarb, on account of oxaluria; also asparagus, strawberries, mustard and other spices, as they irritate the kidneys, and nuts and cheese (not including cream cheese), for the reason that they aggravate the albuminuria. Hot baths (95° F.) should be given for thirty minutes daily. Dry friction of the skin is also beneficial. Cold bathing, especially sea baths, should be avoided.

Constipation should be prevented by the use of salines, preferably the sulphate of soda. Phosphate of soda should never be employed.

It should be borne in mind that nephritic patients, on account of the decreased excretory power of the kidneys, are easily poisoned, especially by opium, morphine, mercury, salicylic acid, and the phosphate of soda. The beneficial effects of a residence in a warm, equable climate can not be too strongly considered. In the early stages of the disease, and during acute exacerbations, the remedies most often indicated are those that have already been considered for acute nephritis. Later in the disease, the medicinal treatment is essentially the same as that of chronic non-exudative nephritis.

Chronic Non-Exudative Nephritis.

Synonyms. — Chronic Interstitial Nephritis, Chronic Bright's Disease, Primary, or Genuine Contracted Kidney, Cirrhotic Kidney, Red Granular Kidney, Renal Arterio-sclerosis, Chronic Productive Nephritis without Exudation, Chronic Diffuse Nephritis, Gouty Kidney.

Definition. — A chronic diffuse inflammation of the kidneys characterized by an overgrowth of the intertubular connective tissue, degeneration and atrophy of the renal parenchyma, resulting ultimately in a shrunken or "contracted" kidney.

Pathology. — "The kidneys are usually small, and together may weigh no more than an ounce and a half. The capsule is thick and adherent; the surface of the organ irregular and covered with small nodules, which have given to it the name of granular kidney. In stripping off the capsule, portions of the kidney substance are removed. Small cysts are frequently seen on the surface. The color is usually reddish, often a very dark red. On section, the substance is tough and resists cutting; the cortex is thin and may measure no more than a couple of millimeters. The pyramids are less wasted. The small arteries are greatly thickened and stand out prominently. The fat about the pelvis is greatly increased.

"Microscopically there is seen a marked increase in the connective tissue and degeneration and atrophy of the secreting structures, glomerular and tubal, the former being most predominant and giving the main characters to the lesion. The following are the most important changes:—

"(a) An increase in the fibrous elements, widely distributed throughout the organ, but more advanced in the cortex, particularly in the tissue between the medullary rays. In the pyramids the distribution of new growth is less patchy and more diffuse. In the early stages of the process there is a small-celled infiltration between the tubes and

around the glomeruli, and finally this becomes fibrillated and is seen encircling the tubules and Bowman's capsules, around the latter, often forming concentric layers.

“(b) The changes in the glomeruli are striking, and in advanced cases a very considerable number of them have undergone complete atrophy and are represented as densely encapsulated hyaline structures. The atrophy is partly due to changes in the capillary walls and multiplication of cells between the loops, partly to extensive hyaline degeneration, and in part, no doubt, to the alterations in the afferent vessels. The normal glomeruli usually show some thickening of the capsule, and increase in the cells of the tufts.

“(c) The tubules show changes in the epithelium, which vary a good deal in different localities. Where the connective-tissue growth is most advanced, they are greatly atrophied, and the epithelium may be represented by small cubical cells. In other instances the epithelium has entirely disappeared. On the other hand, in the regions represented by the projecting granules the tubules are usually dilated, and the epithelium shows hyaline, fatty and granular changes. Very many of them contain dark masses of epithelial débris and tube casts. In the interstitial tissue and in the tubules there may be pigmentary changes due to hemorrhage. The dilatation of the tubules may reach an extreme grade, forming definite cysts.

“(d) The arteries show an advanced sclerosis. The intima is greatly thickened, and there are changes in the adventitia and in the media, consisting in increase in the thickness due to proliferation of the connective tissue, in the latter coat at the expense of the muscular elements.

“The view most generally entertained at present is that the essential lesion is in the secreting tissues of the tubules and the glomeruli, and that the connective tissue overgrowth is secondary to this. Greenfield holds that the primary change is in most instances in the glomeruli, to which both the degeneration in the epithelium of the convoluted tubules and the increase in the intertubular connective tissue are secondary.

“Associated with contracted kidney are general arterio-sclerosis and hypertrophy of the heart. The changes in the arteries have already been described in the section on arterio-sclerosis. The hypertrophy of the heart is almost constant. I do not remember to have seen a well-marked instance of contracted kidney without some hypertrophy of the left ventricle, and the enlargement may reach an extreme grade. The variations depend, no doubt, in part upon the extent of the diffuse arterial degeneration, and there are instances in which the term *cor bovinum*

may be applied to the enlarged organ. In such cases the hypertrophy is not confined to the left ventricle, but involves the entire heart." (Osler.)

Etiology.—While there are some well-determined causes of interstitial nephritis, nevertheless in many instances no cause can be discovered. Osler holds that in some cases the fibroid construction seems only to be "anticipation of the gradual changes which take place in the organ in extreme old age"—the senile kidney. The disease occurs in persons over twenty years of age, more often after middle life, and in males twice as often as in females. Heredity is no doubt a causal factor. The disease often runs in families, especially in those having a tendency to sclerotic degeneration of the arteries. Any cause tending to produce the latter condition may be enumerated as a cause of Bright's disease. There may be hypertrophy or dilatation of the left ventricle, myocarditis or feeble heart. According to Murchison the excessive use of red meats in the diet leads to the production of the uric acid that induces the renal disorder (*uricemia-lithemia*) by deranging the function of the liver. Gout is a common cause of interstitial nephritis. It is associated with so many cases of contracted kidney, that the term gouty kidney has come to be a well-recognized synonym for that condition. Tyson holds that there "are probably no cases of gout, which have continued for any length of time, which are not accompanied by interstitial nephritis. Uric acid in the blood is probably the exciting cause." According to Strümpell, severe acute articular rheumatism is sometimes followed by contracted kidney. Anxiety, grief, business cares, worry, the demands of modern society,—constant high nervous tension,—are no doubt etiological factors, always augmented by too liberal eating and drinking, especially of rich foods and wines. According to Purdy a cold, moist climate predisposes to the disease. It also follows chronic congestion of the kidney, hydronephrosis and chronic pyelitis.

Symptoms.—The onset of the disease is characterized by its insidiousness and the obscurity of its symptoms. There are certainly at the beginning no distinctive symptoms, and as the disease progresses there may be no marked symptoms until those of uremia become manifest and signify the beginning of the end. Oftentimes productive changes in the kidneys have been going on for many years, but only late in life, when an advanced stage of degeneration has been reached, do any marked symptoms develop. Sometimes the latter are excited by some intercurrent affection such as pneumonia or pericarditis. Occasionally an observing physician detects an obscure symptom, and suggests an examination of the urine, which at once reveals the patient's grave condition. Sometimes the peculiar tense and bound-

ing pulse of hypertrophy of the left ventricle, or a slight swelling of the feet or ankles, recognizable only at night or through the unexpected tightness of a boot, may lead to the same examination. In most cases, however, there is an attack of uremia, with headache, stupor, or convulsions, dyspnea, nausea and vomiting, and a tense pulse. The patient may recover from this, but realizes that the health has become impaired, and complains of indigestion, headache, and failing vision. After a more or less lengthy interval the uremic attack is repeated, and if recovery again follows, the health is still farther impaired and the patient more feeble. This continues to the end in a gradually progressive manner. In other cases, one of which has quite recently been under my own care, spasmodic dyspnea is the first manifestation of contracted kidney. In still others, hemiplegia is the first indication of the disease. Sometimes death results from exhaustion and emaciation without distinctive symptoms having been present.

Changes in the Urine. — The urine will be found to present characters which are more or less distinctive and lead easily to a diagnosis. When fresh, it is acid in reaction, copious, often exceeding the normal amount, never scanty except in the last stages of the disease. The quantity may reach 90 ounces. The patient usually has to rise once or twice at night to urinate. There may be corresponding thirst. The urine is light in color and of low specific gravity, — 1005 to 1015, — and contains a trifling or moderate flocculent sediment. It is generally albuminous, but the albumin is small in amount and may be temporarily absent, or it may be absent before a meal and present after it. During the acute exacerbations of the nephritis, or in the latter stages when the heart begins to fail, albumin and casts may be present in considerable quantities. The casts seen are almost always hyaline or granular. The urea is diminished, as in all forms of Bright's disease, and there is little or no sediment. Toward the end, the uremic attacks occur, the urine diminishes in quantity, the albumin increases, and casts become much more numerous and varied in character. In rare cases blood discs are present and sometimes hematuria.

Cerebral Symptoms. — These are manifest in most cases, and are due to a variety of causes, but usually indicate uremic disturbance. Headache, usually frontal, and often excessively severe, is very common. Neuralgic pains in various parts of the body and sleeplessness are of frequent occurrence. Muscular twitchings and general convulsions are serious indications. Drowsiness, stupor and coma, or delirium, either mild or furious are manifestations of uremia. Cerebral hemor-

rhage, due to atheroma of the blood vessels, followed by hemiplegia, may be the first symptoms indicating renal disease.

Uremia. — The symptoms already noted are due to uremia and many others characteristic of that disease are more frequently present in this than any other form of nephritis. A vast majority of cases of non-exudative nephritis finally succumb to chronic uremia in some form of manifestation, and not uncommonly it is the first condition present indicating the character of the disease.

Circulatory Symptoms. — *Hypertrophy of the left ventricle* of the heart without valvular disease is so constant as to be alone suggestive of the disease. It is invariably present in every case of long standing, and is usually present when the disease is first recognized. The physical signs of hypertrophy of the left ventricle elsewhere described are more or less present, accentuation of the aortic second sound being the most important. General cardiac symptoms are not present unless dilatation and heart weakness are present, when the pulse will fall in tension and signs of venous congestions will appear, so that the condition will resemble that of a chronic heart lesion, with cardiac distress, dyspnea, palpitation and the usual physical signs minus those of valvular disease, though murmurs may also be present. Otherwise the pulse is hard and resisting, indicating high tension and thickening from endo-arteritis, which also in the radial artery causes a tortuous condition.

Respiratory Symptoms. — Dyspnea, either of cardiac or uremic origin is common. It is frequently the first symptom noticed, appearing in spasmodic attacks aggravated by exertion or by the recumbent position, and is usually worse at night. Cheyne-Stokes breathing may occur toward the close of the disease, and is a very unfavorable symptom. Edema of the glottis and pulmonary edema are liable to occur at any time, especially during acute uremic attacks. Hydrothorax or emphysema may appear before the fatal termination.

Gastro-intestinal Symptoms. — These are chiefly nausea and vomiting, due to gastric catarrh, or of uremic origin. Loss of appetite and indigestion are common. Diarrhea is not usual, but may occur toward the close, and prove difficult to control.

Special Senses. — *Dimness of vision* due to retinitis albuminurica is a characteristic symptom. It is often the first recognized, and hence the diagnosis is frequently first made by the ophthalmologist. It is a sign of advanced disease. Patients rarely live over two years after this symptom is present. This is a common opinion, and I have verified it in several cases. Such patients are also liable to cerebral hemorrhage at any time, from arterio-sclerosis. Sudden and complete blindness comes on in occasional cases, — uremic amaurosis, — and is always a

grave symptom. Auditory disturbances also occur, such as ringing in the ears with dizziness and more or less deafness.

Skin. — Edema rarely exists in this form of nephritis, except when it occurs in the ankles and limbs late in the disease, as a result of a dilated and failing heart. Usually the skin is dry, and sweating is uncommon. In some cases urea is excreted, causing minute white scales like frost to appear on the skin. The pallor present is not marked. Frequently there is a cyanotic appearance. Sometimes purpura is present.

General Symptoms. — There is some anemia, but it is not marked as in exudative nephritis. The nutrition is affected, debility and emaciation gradually supervening until in advanced cases they become extreme. Muscular cramps, involving the calves of the legs, especially at night, are of frequent occurrence. According to Dieulafoy, formication, numbness, and pallor of one or more fingers (the so-called "dead finger") are sometimes the earliest symptoms of chronic Bright's disease.

Diagnosis. — The diagnosis of interstitial nephritis is usually easy, provided that in any way an examination of the urine has been suggested. Otherwise cases often become far advanced before their nature is recognized, and doubtless some cases are never recognized. The conditions which should suggest such an examination are a feeling of constant weariness, slight swelling of the feet, drowsiness, frequent headaches, repeated epistaxis, vertigo, confused intellect, dyspeptic symptoms, obstinate nausea, increasing pulse tension, delirium, coma and convulsions.

Both the morning and evening urine should be repeatedly examined, both chemically and microscopically. It should be remembered that sometimes albumin is entirely absent, and also that the presence of traces of albumin or of a few casts is not positive evidence of chronic Bright's disease. If the urine is increased in quantity, of low specific gravity, slight persistent albuminuria, delicate hyaline, pale granular casts, and there is hypertrophy of the left ventricle, even in the absence of other symptoms there are good reasons for making a diagnosis of chronic Bright's disease.

Prognosis. — The disease is absolutely incurable, but by judicious treatment life is often prolonged for many years. It must be borne in mind, however, that uremia or some intercurrent disease may at any time develop and prove fatal. Cardiac dilatation and heart weakness indicate that the end is not far off. Cases of chronic Bright's disease have been known to last for twenty and even thirty years, but sooner or later life is destroyed.

Treatment. — Dietetic and hygienic measures are of the utmost importance, and will often control and hold in check the advancement of the cirrhotic changes. This is largely accomplished by maintaining the integrity of the blood and preventing the accumulation of urea and allied compounds. No diet can be prescribed that will absolutely cover all cases. It should be light and nourishing, but not excessive. When gastric disturbances are present, the patient should be temporarily confined to a milk diet, but this can not with benefit and safety be kept up for any great length of time. Lean meat should be eaten but once a day, but the ingestion of fats should be encouraged. Of meats, sweetbreads, liver, bacon, tripe, white meat of fowl and fish are best. Milk, cream, butter, eggs, vegetables and fruits are allowed. Alcohol should be prohibited; tea and coffee may be allowed in moderation. Saundby's rule is a good guide: "Eat very sparingly of butcher's meat; avoid malt liquors, spirits, and strong wines." The urinary secretion should be kept free by drinking freely of distilled water or some natural mineral water. Constipation must be prevented even to the extent of employing saline cathartics, avoiding, however, the phosphate of soda. The skin should be kept in a healthy condition; daily tepid bathing followed by friction is very desirable, but cold bathing, especially sea-bathing must be interdicted. Cold and damp weather, especially sudden changes, should be avoided, and the body protected at all seasons by wearing wool next the skin. A warm, equable climate is very desirable, especially during the winter months, and when possible the change of residence should be made permanent. The patient should lead an equable life, avoiding all excesses of both mind and body. Mental and physical exercise should be moderate, and all emotional excitement, including sexual, should be avoided.

Therapeutics. — Many of the remedies already mentioned under Acute Nephritis may be indicated and useful in chronic Bright's disease. Their indications have already been given and need not be repeated. These are: *Apis* (3x), *Canth.* (3x), *Terebinth.* (2x), *Rhus tox.* (3x), *Merc. cor.* (3x), *Cuprum ars.* (3x), *Arsen. alb.* (3x), *Phosphorus* (3x), *Digitalis* (1x) and *Convallaria* (1x).

Aurum mur. (3x). — The chloride of gold has gained a desirable reputation in the treatment of interstitial nephritis. Millard considers it most useful when the disease is associated with nervous symptoms, hypochondriasis, irritability and vertigo. Goodno considers it "of great value for the treatment of the very early symptoms. There are quite a large number of the cases of chronic interstitial nephritis which present symptoms for a long period before the urine gives evidence of the disease which is within the reach of the ordinary observer. These

patients have dyspeptic symptoms, weakness, etc., with little of a suspicious character in the condition of the urine, unless the centrifuge is employed, when tube casts will be quite regularly found. This is the stage in which to most successfully treat interstitial nephritis, and the period of the disease when the chloride of gold is most valuable. It is suggested by copious clear urine, firm pulse, possibly slight dyspnea or palpitation, and a variety of digestive and nervous symptoms. These patients may be thought to be neurasthenic. The dose may consist of ten drops of the second decimal dilution, repeated two to four times daily, and can be gradually increased to twenty drops, in some cases, with advantage. Triturations, pellets, etc., deteriorate rapidly. This medicine may be administered for months, resuming its use as soon as possible after any intercurrent remedy."

Plumbum (6x).—This drug produces albumin in the urine, and evidences a renal degeneration. According to Farrington it is useful in chronic Bright's disease when there is very little dropsy or albuminuria, but a marked tendency to uremic convulsions. Lilienthal gives the following indications: granular kidney, loss of appetite, frontal headache, worse from mental application. Dyspnea, worse at night; edema of the ankles; dry skin, even after exercise; colicky pains; obstinate constipation; retracted abdomen. Amaurosis from atrophy of optic nerve (Phos. from retinal hemorrhage). Epileptiform conditions, paralysis; cutaneous anesthesia with albuminuria. Pale skin, rapid emaciation and debility.

Kali iod. (1x).—The iodide of potash is often found indicated in syphilitic cases. It seems to have a decided action upon renal lesions; and also has the power to reduce arterial tension, which is often important.

Phosphoric acid (1x).—Frequent, profuse, watery urine; deposits a sediment; urine like milk, even coagulating; great debility and loss of flesh, mental exhaustion; low arterial tension.

In the long course of interstitial nephritis many other remedies may be indicated, the symptoms being the only guide for their administration.

AMYLOID KIDNEY.

Definition.—Amyloid degeneration of the kidney, also known as waxy, lardaceous or albuminoid degeneration, is a pathological condition of the kidney in which its structure is infiltrated with an albuminous substance. It is usually coexistent with the same degeneration occurring elsewhere, and is often associated with chronic exudative nephritis.

Pathology.—"Anatomically the amyloid kidney is large and pale,

the surface smooth, and the *venæ stellatæ* well marked. On section the cortex is large and may show a peculiar glistening, infiltrated appearance, and the glomeruli are very distinct. The pyramids, in striking contrast to the cortex, are of a deep red color. A section soaked in dilute tincture of iodine shows spots of a walnut or mahogany brown color. The Malpighian tufts and the straight vessels may be most affected. In lardaceous disease of the kidneys the organs are not always enlarged. They may be normal in size, or small, pale and granular. The amyloid change is first seen in the Malpighian tufts, and then involves the afferent and efferent vessels and the straight vessels. It may be confined entirely to them. In later stages of the disease the tubules are affected, chiefly the membrane, rarely, if ever, the cells themselves. In addition, the kidneys always show signs of diffuse nephritis. The Bowman's capsules are thickened, there may be glomerulitis, and the tubal epithelium is swollen, granular, and fatty." (Osler.)

Etiology.— Probably the most frequent cause of amyloid degeneration is prolonged suppuration, especially of the bones, whether tubercular, syphilitic, or traumatic in origin. It occurs secondarily to other wasting diseases, especially tuberculosis, and more particularly tuberculosis of the lungs,—chronic ulcerative phthisis. Chronic empyema, intestinal ulcers, vesico-vaginal fistulæ, and other purulent affections, chronic in nature, also have the same etiologic effect. Syphilis itself, independently of the tertiary conditions which it produces, is a frequent cause of amyloid disease. Cachectic states of any kind, chronic dysentery, ulceration of the bowels, and chronic albuminuria are possible causes. It is associated with amyloid degeneration of the spleen, liver and intestines.

Symptoms.— A person suffering with any one of the diseases giving rise to amyloid kidney, such as phthisis or bone-necrosis, may acquire the disease without additional apparent symptoms, except a slight growing frequency in urination, which is not always present. The urine is usually abundant, pale, and of a low specific gravity. At first no casts are present, or they are exceedingly scanty, and hyaline or faintly granular. The amyloid reaction may be elicited with the hyaline casts. Later waxy casts, fatty casts and free fatty epithelium from the tubules of the kidney may be superadded, as well as free oil-drops. Albumin is usually present in considerable quantity, and there may be globulin. Edema is not always present. Edema of the feet may appear while the patient is up and about, but disappears during the night while he is in bed. A cachectic and anemic condition develops, with wasting of flesh and strength. To this condition are added the general symptoms of

the associated nephritis, or of the original suppurative or cachectic disease to which the amyloid changes are secondary. The disease is almost always accompanied by amyloid changes in the liver, spleen or intestines, of which the usual evidences are present, and which are of diagnostic significance. The liver and spleen are always enlarged, and the blood-vessels of the stomach and intestines are often involved. In the former event obstinate vomiting and in the latter equally obstinate diarrhea results, the latter being of more frequent occurrence.

Diagnosis. — The diagnosis of amyloid degeneration of the kidneys can not, like that of chronic Bright's disease, be readily made by an examination of the urine alone. In some instances, it is associated with chronic exudative nephritis; and in others, it so simulates that disease that a differential diagnosis is impossible. When there is present evidences of tuberculosis, chronic bone-suppurations, or syphilis, with coexisting hepatic and splenic enlargements, and wasting and cachexia, together with an increased quantity of pale, clear urine, of low specific gravity and containing albumin, usually in large amounts, the diagnosis of amyloid disease is safely made. It is possible to confound amyloid disease with chronic non-exudative (interstitial) nephritis, but in the latter there is almost total absence of dropsy, slight albuminuria, and scanty sediment, in which granular and hyaline casts are found, and there is arterio-sclerosis, cardiac hypertrophy, and pronounced tendency to uremia.

Prognosis. — The prognosis depends largely upon the curability of the causative disease. If the latter can be cured, the patient, if young, can be so nearly rid of the amyloid disease that he is practically well, though it is doubtful if the diseased structures are ever restored to their normal state. If the causative disease is incurable, the amyloid disease only hastens the fatal termination. The duration of the disease also depends upon the course of the causative disease, and may be prolonged for several months, or even two or three years. If obstinate vomiting and diarrhea supervene, the end is not far off.

Treatment. — This depends almost entirely upon the nature of the primary disease, and it is to the control of the latter that the chief efforts of treatment are to be directed. Tuberculosis, bone-suppurations, and syphilis will each give, if present, its characteristic symptoms, and thus afford the necessary indications for treatment. In the absence of these processes, the treatment is essentially the same as that of chronic exudative nephritis. The remedies most often required are *Arsen. iod.* (3x), *Aurum mur.* (3x), *Kali iod.* (1x), *Merc. sol.* (3x), *Merc. biniod* (3x), *Hepar sulph.* (3x), *Hydriodic acid* (2x), *Nitric acid* (3x) and *Phosph. acid* (1x).

PYELITIS.

Synonyms.—Consecutive Nephritis, Pyelo-nephritis, Pyonephrosis.

Definition.—Inflammation of the pelvis of the kidney, and the conditions which result from it, as indicated in the synonyms above given.

Pathology.—“In the early stages of pyelitis, the mucous membrane is turbid, somewhat swollen, and may show ecchymoses, or a grayish pseudo-membrane. The urine in the pelvis is cloudy, and, on examination, numbers of epithelial cells are seen.

“In the calculous pyelitis, there may be only slight turbidity of the membrane, which has been called by some catarrhal pyelitis. More commonly the mucosa is roughened, grayish in color, and thick. Under these circumstances, there is almost always more or less dilatation of the calyces and flattening of the papillæ. Following this condition, there may be (a) extension of the suppurative process to the kidney itself, forming a pyelo-nephritis; (b) a gradual dilatation of the calyces, with atrophy of the kidney substance, and finally the production of the condition of pyonephrosis, in which the entire organ is represented by a sac of pus, with or without a thin shell of renal tissue; (c) after the kidney structure has been destroyed by suppuration, and the obstruction at the orifice of the pelvis persists, the fluid portions may be absorbed, the pus becomes inspissated, so that the organ is represented by a series of sacculi containing grayish, putty-like masses, which may become impregnated with lime salts.

“Tuberculous pyelitis, as already described, usually starts upon the apices of the pyramids, and may at first be limited in extent. Ultimately the condition produced may be similar to that of calculous pyelitis. Pyonephrosis is quite as frequent a sequence, while the final transformation of the pus into a putty-like material impregnated with salts, forming the so-called scrofulous kidney, is even commoner.

“The pyelitis consecutive to cystitis is usually bilateral, and the kidney is apt to be involved, forming the so-called *surgical kidney*—acute suppurative nephritis. There are lines of suppuration extending along the pyramids, or small abscesses in the cortex, often just beneath the capsule; or there may be wedge-shaped abscesses. The pus organisms either pass up the tubules or, as Stephen has shown, pass by the lymphatics.” (Osler).

Etiology.—Pyelitis usually occurs from the extension of a morbid process from the bladder to the pelvis of the kidney, by the ureter. This may be the extension upward of a urethritis, cystitis or ureteritis,

whether of specific origin or otherwise. Frequently a catarrhal inflammation of the bladder is excited by the decomposition of the retained urine, and the inflammation extends to and involves the kidneys. In some instances the urine is retained in the pelvis of the kidney and there undergoes decomposition and excites local inflammation. Retention of the urine may be due to stricture of the urethra or even phimosis, and to stone in the bladder or ureter or pelvis of the kidney. A very frequent cause of pyelitis is the presence of a renal calculus or other foreign body in the pelvis of the kidney producing inflammation by direct irritation of the substance of the organ. It is also caused by irritating diuretics such as *Copaiba*, turpentine and *Cantharides*. It occurs in connection with other renal diseases, such as tuberculosis, carcinoma and acute nephritis. It may occur in the course of infectious diseases—pyemia, puerperal fever and the exanthemata. Parasites such as the *echinococcus* (hydatids), *distoma*, *strongylus* and *filaria*, may give rise to pyelitis.

Symptoms.—The symptoms of pyelitis are preceded and often overshadowed by those of the causative condition. For instance, if caused by cystitis, the symptoms of this condition occur first; if from renal calculi the characteristic symptoms of the latter precede those of pyelitis. The symptoms also vary greatly according to the character of the exciting cause. In mild cases of catarrhal inflammation, pain and tenderness in the region of the kidney. Tenderness is usually the most constant and distinctive symptom. If pain is present, it is usually most severe in the renal region, whence it radiates along the ureters toward the front of the abdomen and groin. Where the condition is the result of impacted calculus, the seat of the impaction is the primary seat of pain. The pain is always intermittent to a degree, sometimes totally so, but generally it is more or less constant, paroxysmally increased. Frequently the beginning of the disease is marked by chilliness, mild fever, frequent urination, the urine milky in appearance, when voided, acid or neutral in reaction, and depositing a copious sediment, whitish or yellowish-white in color, containing only a small amount of albumin, no more than is due to the pus. In cases due to renal calculi the usual renal colic is ordinarily present, and the urine contains blood sometimes in quantities and considerable pus. In pyelonephritis the symptoms are pyemic in character, the fever is hectic or typhoid, there is low, muttering delirium, subsultus tendinum, stupor, decline in strength, and loss of flesh, with sometimes a tumor in the lumbar region. If both kidneys are affected, or in chronic cases atrophy of the kidney, uremic symptoms are not uncommon. Evidences of amyloid disease may be revealed in long-standing, chronic cases.

Diagnosis.—It is often impossible to exclude nephritis, cystitis, and urethritis. The presence of some cause of obstruction and decomposition of urine, and if the urine contains pus and there is tenderness over the region of the kidney and pain extending from the renal region down the course of the ureters, pyelitis may be suspected with a considerable degree of certainty. The purulent urine is always acid in pyelitis, whereas the urine in cystitis is always alkaline.

Prognosis.—The prognosis in catarrhal cases is good. They generally recover in from one to two weeks. Those cases occurring in the course of infectious diseases usually terminate with the associated disease. Cases due to obstruction depend in their prognosis entirely upon the possibility of a timely removal of the obstruction. Cases resulting from calculus usually become chronic. Suppurative pyelitis and pyelo-nephritis have a variable duration, and may continue for months, even years, and are apt to end fatally from exhaustion or uremia. Sometimes before death there is perforation and discharge of the pus into neighboring cavities or organs. In surgical kidney, if both kidneys are involved, the case is hopeless; but if but one kidney alone be involved, the cause removed, the patient recovers.

Treatment.—The treatment depends largely upon the causative condition. The primary disease must be treated and removed if possible. After the pyelitis is developed, the patient should be kept in bed, and treated locally with hot poultices, hot-water bags, fomentations and dry cupping. The urine should be rendered as unirritating as possible by the use of alkaline mineral waters and demulcent drinks. Milk and buttermilk should be the chief articles of diet, all solid or irritating food being avoided. The bladder should be washed once daily with a solution of boric acid. In severe purulent pyelitis, pyelo-nephritis and pyonephrosis, surgical interference may be advisable.

Internal treatment will depend entirely upon the symptomatology of the case. Consult *Acon.* (2x), *Arsen.* (3x), *Bell.* (3x), *Benzoic acid* (3x), *Berberis* (1x), *Bry.* (3x), *Cannab. sat.* (1x), *Canth.* (3x), *Chimaph.* (1x), *Chin. ars.* (2x), *Hydrastis* (2x), *Merc. cor.* (3x), *Nux vom.* (3x), *Puls.* (3x), *Rhus tox.* (3x), *Silic.* (6x), *Sulph.* (6x), *Tereb.* (3x). Hughes recommends *Uva ursi*. The empirical use of boric acid, five to ten grains three times a day, is recommended; also sandal oil, buchu and copaiva.

HYDRONEPHROSIS.

Definition.—A collection of urine in the pelvis and calyces of the kidney, the result of obstruction, succeeded by dilatation and atrophy due to the presence of the accumulated fluid.

Pathology.—Usually but one kidney is involved. The pelvis of the kidney becomes dilated, and pressure of the fluid produces atrophy of the renal tissue, sometimes to such an extent that only remnants of the kidney substance remain in the walls inclosing the fluid, which has become converted into a cyst. It is said that the greatest dilatation takes place in those cases where the obstruction is intermittent or not complete. The contents of the tumor may be purely aqueous, more frequently they are slightly turbid, and contain a few pus cells, also uric acid, urea and albumin. In cases of long duration the urinary salts may disappear, so that the fluid may not be characteristic. In extreme cases the cyst may become very large, containing from a few quarts to several gallons of the fluid.

Etiology.—Hydronephrosis is, in most cases, caused by some congenital or acquired disease that produces occlusion of the ureter. According to Roberts from 20 to 35 per cent of cases are congenital. These cases may be due to malformation of the ureter, or contraction or twisting, or an oblique insertion of the ureter at such angle as to interfere with the easy discharge of the secretion. Among acquired diseases liable to produce obstruction of the ureters are occlusion of the ureter by cicatricial adhesion, lithiasis, tuberculosis of the ureter, pressure on the ureter by tumors, a retroflexed or prolapsed uterus, bands of lymph in healed peritonitis, and twists in the ureter of the movable kidney. Finally carcinoma of the bladder, and even hypertrophy of the prostate, and stricture of the urethra may be causes.

Symptoms.—In most cases there are no symptoms, and the first evidence of the trouble is the appearance of a tumor in the region of the kidney, enlarging toward the hypochondrium and the median line. Most cases are unilateral, and in some instances the presence of a tumor is not observed until after the ureter of the remaining kidney has become obstructed, and symptoms of uremia have supervened. Uremic symptoms come on earlier in bilateral cases. Usually the patient complains of a weight and dragging sensation, and sometimes of severe shooting pains in the loins, and down the thighs. Other symptoms resulting directly from pressure may also occur, especially nausea, vomiting and constipation.

The tumor appears as a firm, somewhat elastic, rounded growth. Fluctuation is observed in some cases. A characteristic sign of kidney tumor is the tympanitic percussion note elicited from the presence of the colon overlying the tumor. An intermittent hydronephrosis occurs which is quite characteristic. In such cases there is an occasional sudden disappearance of the tumor simultaneous with the discharge of

a large quantity of fluid from the bladder, followed by gradual refilling of the sac, and return of the tumor. This intermittent discharge may be kept up for years. Such an event is usually ascribed to a valvular obstruction in the ureter which at times yields to the pressure of the accumulated fluid; or it may be due to the undoing of a twist in the ureter of a floating kidney. Chills, fever and sweat, nausea, vomiting and rapid pulse indicate suppuration, which may result in the formation of a pyonephrosis. In such cases the fluid will be turbid and show pus plainly, whether aspirated or discharged.

Diagnosis. — With small cysts the diagnosis is usually difficult. The chief diagnostic point is the subsidence of the tumor simultaneous with a copious discharge from the bladder. The condition is frequently mistaken for an ovarian tumor. The latter is more mobile, there is an absence of the tympanitic note from the overlying colon, and the tumor does not first show in the renal region, nor so completely fill that region. In case of doubt aspiration may be necessary, the characters of the ovarian fluid and that of hydronephrosis being widely different. Aspiration will also serve to differentiate from solid growths, as well as from ascites and tumors of the liver, gall, bladder and spleen.

Prognosis. — The prognosis is, as a rule, unfavorable. In unilateral cases the healthy kidney may largely perform the work of the diseased organ, and thus render the prognosis somewhat more favorable. Bilateral cases are almost invariably fatal, death usually resulting from uremia. Suppuration of the cyst is also usually fatal. If the cause of the obstruction can be removed, either by surgical or other measures, recovery may take place, and this may also occur after a spontaneous discharge, the fluid not reaccumulating, though such instances are rare.

Treatment. — Gentle massage of the tumor is said to be of benefit. In large tumors repeated aspirations sometimes prolong life. Beyond these measures and the symptomatic treatment, which is often palliative, the treatment of hydronephrosis is purely surgical. The measures employed in extreme cases are puncture, incision and drainage, nephrorrhaphy, nephrectomy and the formation of a renal fistula.

NEPHROLITHIASIS.

Synonyms. — Renal Calculi, Pyelitis Calculosa, Renal Colic, Gravel Stone in the Kidney.

Definition. — The formation in the kidney, or in its pelvis, of fine or coarse concretions, by the precipitation of certain solid constituents of the urine.

Pathology. — The term nephrolithiasis not only covers those

concretions large enough to justify the term "stone in the kidney," but also smaller concretions known as "gravel" and fine particles known as "sand." The larger concretions or calculi are found only in the pelvis of the kidney. Sand and gravel are found in the substance of the kidney and also in the pelvis. Sand in the urine is made up of particles of uric acid or oxalate of lime. The latter also may form stones of moderate size, but with this exception we do not find renal calculi made up of a single constituent. Calculi formed of lime oxalate alone are termed "mulberry calculi." They are sometimes formed about a uric-acid nucleus. In addition to the above varieties the most important are those formed by uric-acid, or where oxalate-of-lime stone forms the nucleus. About this accumulate in concentric layers the phosphates, which make up the great bulk of all large stones as well as some stones in their entirety. Calculi of phosphates alone occur oftener in the bladder than in the kidney. In some instances the nuclei consists of mucus, of a small blood clot, or some other fragment of matter that has accidentally reached the urinary passages. Uric-acid stones are usually smooth, very hard in consistency, and of a dark red or reddish-brown color. They are rarely larger than one fourth of an inch in diameter, and are often much smaller. Oxalate-of-lime calculi are very hard and uneven, studded with points and spines, and usually dark colored. They are about the same size as uric-acid stones and resemble a mulberry in appearance. Their hard-pointed projections produce exquisite pain in their passage from the kidney through the ureter into the bladder. Phosphatic calculi are grayish-white in color and comparatively soft, so that they can often be easily crushed between the fingers. The so-called dendritic or coral calculi form complete molds of the pelvis and their calyces, giving an irregular branching shape. Rarer forms of calculi are made up of xanthine, carbonate of lime and urostealith.

The usual secondary effect of renal calculi is a suppurative pyelitis and pyonephrosis, but this is by no means a constant occurrence, as in some cases the calculi go on forming, and are passed for years without producing serious lesion or impairing the health to any marked extent.

Etiology.—The actual causes of renal calculi and their exact manner of formation are not definitely known. Uric-acid stones are the result of the presence of uric acid in a very acid urine which favors its precipitation. According to Roberts the deposition of uric acid is favored by the following urinary conditions: (1) High acidity; (2) poverty of salines; (3) low pigmentation; (4) high percentage of uric acid. The occurrence of calculi of uric acid or of oxalate of lime

is favored by gouty conditions and by functional disturbance of the liver.

Uric-acid stones occur the oftenest in advanced life, while those composed of urates occur especially in children. Phosphatic calculi are more commonly associated with inflammation of the pelvis of the kidney, which, it is possible, acts as an exciting cause. The presence in the urinary tract of mucus, blood casts, or other material fragment, to form a nucleus for the concretion, may be in many instances the primary cause, and without which the calculi would not form. The drinking of hard water containing lime seems to have apparently little influence (see Oxaluria). Sedentary habits seem to predispose to stone, and they occur oftener in males than females.

Symptoms. — Many cases of sand and gravel exist for years without exciting any marked symptoms. In some instances layer stones in the pelvis of the kidney or in its substance do not create symptoms sufficiently definite to excite suspicion as to the real character of the trouble. As a rule, however, the patient experiences pain in the region of the kidney, associated with more or less tenderness. It is aggravated by motion, especially rough motion, and there are certain positions of the body in which the patient is made more or less uncomfortable. The chief symptoms of nephrolithiasis are those which result either from the sudden blocking of a ureter, or more commonly, the passage of the stone through the ureter. Small or smooth concretions may pass with little or no pain, but usually the passage is attended with an intense agonizing pain, termed renal colic. The attack may come on suddenly from no apparent cause, or may follow sudden muscular effort. The pain is severe and steady, with cutting or tearing exacerbations. It radiates downward into the groin and the neighborhood of the bladder, down the inside of the thighs and into the testicle, which is often retracted. Sometimes the pain is diffused through the lumbar and abdominal region. The pain comes on suddenly, lasts a longer or a shorter time, and disappears abruptly as the stone falls into the bladder. Nausea and vomiting are frequently present, and in very severe cases the patient becomes collapsed with sweat, rapid, feeble pulse, anxiety, syncope, and even, especially in children, convulsions. In some cases there are chilly feelings with a moderate fever during the attack. There is usually frequent and painful urination, the latter being probably due to a reflex spasm of the neck of the bladder. The urine is usually scanty and may contain blood. If pus and pelvic epithelium are present in the urine, they indicate pyelitis. In rare cases the urine is copious and limpid. In some cases there is complete suppression of urine, even where the

kidney on the opposite side is normal, though more frequently when it is diseased, and death from uremia may occur in consequence. After an attack there may be complete recovery at once, but more often a dull, aching pain, with some tenderness over the kidney, continues for several days.

In those cases where a stone becomes impacted in the ureter, blocking the passage, the symptoms at first are those of renal colic, but the paroxysm of acute pain gradually ceases, leaving a dull ache which finally disappears. If the impaction is relieved after a while by the passage of the stone, this is usually followed by the passage of a large quantity of urine, especially if the other kidney is atrophied from a previous calculus obstruction. If the calculus remains, completely obstructing the ureter, atrophy of the kidney takes place, unless the healthy kidney remaining proves capable of doing the work of the disabled organ, in which case no symptoms may develop. If both kidneys are diseased, uremic symptoms will develop in a week or two, and the patient die. Hydronephrosis does not occur from sudden and complete obstruction, but only when the impaction is incomplete, so that there is a gradual back pressure exerted upon the pelvis of the kidney.

Diagnosis.—The diagnosis is only positive and easily made when an attack of renal colic, as previously described, suddenly ceases, and a calculus is found in the next urine passed. In suspected cases the urine should always be carefully examined after an attack. Renal colic is sometimes confounded with biliary or intestinal colic, but the symptoms are so distinctive that this ought not to occur. In biliary colic there is a rapidly succeeding jaundice, the stools are of an ashy color, the urine is bile-stained, and the pain is more toward the epigastric region as a center, and thence through the upper abdomen and perhaps through to the right shoulder blade. In intestinal colic all renal and biliary symptoms are absent, the cause is usually dietetic, and the abdominal pain characteristic. Renal colic may be induced by other causes than stone. A clot of blood or some other fragment may temporarily occlude the ureter; also pressure from growths or the twisting of the ureter of a floating kidney.

Prognosis.—The prognosis should always be guarded on account of possible contingencies and complications, yet with modern surgery the most unfavorable cases of a few years ago are rendered much safer. An attack of renal colic may in itself be fatal, but this is quite unusual. Large calculi, especially the dendritic form are curable only by surgical means. If allowed to remain, they will ultimately result in suppurative pyelo-nephritis, pyonephrosis, hydronephrosis or perinephric

abscess, and under circumstances already mentioned fatal uremia may develop.

Treatment. — The treatment of renal colic requires prompt and efficient palliation, or, from the intensity of the pain, the patient may pass into a collapse and die from cardiac failure. Morphine combined with Atropin, hypodermatically, is the most efficient remedy. Hot baths and hot applications applied to the abdomen and loins are of marked benefit. When the suffering is excessive, the patient should be given occasional whiffs of chloroform. Hot drinks are also beneficial. It is a good plan to unload the bowels with a large hot-water enema.

Belladonna, Nux vomica, Lycopodium, Berberis, Pareira brava and other remedies have been recommended for the renal colic, and, if well indicated, they may answer the purpose in mild cases, certainly not in those of any great severity. The sudden cessation of suffering from the dropping of the concretion into the bladder has sometimes led the physician to give undue credit to the action of remedies. The condition is a mechanical one, and beyond the range of symptomatic treatment. Not so, however, as to the treatment of the conditions of the system that underlie and may give rise to renal calculi, in which the administration of the indicated remedies may render most valuable service. Let us first, however, consider the *hygienic* and *dietetic* measures that are usually recommended, and are considered by many to be of the utmost importance. Plenty of exercise in the open air is important, in order that the nutrition may be maintained and any excess in weight and the accumulation of fat avoided. Diet has little to do with the formation of renal calculi, but at the same time those suffering from uric-acid calculi should avoid a meat diet, especially the red meats; and fats, sugars and alcohol should be used sparingly, while fruits, vegetables and milk may be used freely. In phosphatic stones, meats may be allowed, and vegetables and milk used sparingly, as they have a tendency to render the urine alkaline. When oxalate-of-lime concretions are present, vegetables which contain oxalates should be avoided, chief of these is rhubarb.

In all varieties the patient should be encouraged to drink large quantities of distilled or pure negative mineral waters. In uric-acid stones alkaline waters are especially indicated, all carbonated waters being beneficial. There are mineral waters for which their proprietors claim the power of dissolving renal calculi. Their utility for such purpose is doubtful. According to Haig, the lithium waters are useless. Piperazin will dissolve uric acid outside of the body, and is highly recommended by some as a solvent of renal calculi. Citrate of potash given in doses sufficient to keep the urine neutral in reaction is recom-

mended. The treatment must be discontinued as long as the urine is alkaline or ammoniacal. According to Roberts, three conditions are necessary for success in this treatment; the calculus must be of uric acid; it must be of small size; and the urine must not be alkaline or ammoniacal, as otherwise sodium biurate or phosphate is precipitated upon the calculus, rendering further solution impossible. He gives for weeks or months one-half to one drachm of citrate of potash every three hours, in six or eight ounces of water. Oxalate of lime or phosphatic concretions are not influenced by this method. In protracted and obstinate cases, where the patient suffers much and is incapacitated, and especially where pyelitis, pyelo-nephritis, pyonephrosis, or perinephric abscess has developed, surgical measures should be adopted.

Therapeutics.—The remedies of apparently most service in controlling the conditions of the system giving rise to renal calculi are: Sarsaparilla, Lycopodium, Berberis, Benzoic acid, Nux vomica and Sulphur. The following indications are furnished by Dr. S. Lilienthal:—

Arsenicum (3x).—Renal pains with the occasional passage of gravel; pains extend along the ureters. Uric-acid sediment; micturition difficult. Alkaline urine with sediment of mucus and urate of lime.

Asparagus (2x).—Nephritic colic with passage of gravel while urinating. Urine of unpleasant odor; bloody urine; reddish deposit in vessel.

Belladonna (3x).—Spasmodic, cramp-like pain along the ureters. High-colored urine with brick-dust sediment. Urine gold-colored, depositing a red sediment, with nocturnal pressure on the bladder, and shooting, burning pains in the region of the kidneys; when a calculus or gravel is present.

Benzoic acid (2x).—This remedy has among its provings: acid and irritant urine; urine of a disagreeable odor, cloudy and alkaline. Urine contains urates of ammonia; whitish sediment in the urine, composed of phosphate and carbonate of lime. Urine dark colored, with mucous sediment. Urine with high specific gravity; granular phosphatic deposits in the urine. Gouty symptoms with vesical catarrh and gastric complications. Benzoate of ammonia is recommended also by Professor Bartholow when the urine is ammoniacal and loaded with phosphates.

Berberis vulg. (1x).—Urine dark red or yellow in color, becoming turbid, and with a mucous sediment, or reddish mealy sediment. Pain, soreness, and burning in the biliary and urinary tracts, especially when severe pain in the hip is present.

Lithium carb. (1x).—Used by the old school for gouty and rheumatic troubles. Lithia salts are said to dissolve gravel and render the

urine clear. In the new school its use is recommended when there is scanty, dark, acrid urine, with dark reddish-brown deposit; urine turbid with mucous deposit; urine profuse with uric-acid deposit. Vesical and abdominal pains. Rheumatic stiffness in the limbs.

Lycopodium (6x).— This remedy has lumbar pains radiating into the abdomen and inguinal canal, simulating nephritic colic. Dark-colored ammoniacal urine, with reddish, sandy sediment. Vesical strangury.

Nux vomica (3x) will be of service in the concomitant conditions, rather than after the formation of gravel. Its use in correcting disordered assimilative functions is too well known to need more than a passing reference.

Ocinum canum (2x).— Turbid urine with a white and albuminous sediment. Cramping pains in the kidneys, renal colic with vomiting; urine red, with brick-dust sediment, or discharge of large quantities of bloody urine, or thick, purulent urine.

Oxalic acid (2x).— Acid urine, depositing crystals of uric acid and oxalate of lime. Urine causes a burning sensation when passing, depositing a milky-white sediment. Pain in renal region.

Pareira brava (2x). — Difficult micturition, with strangury and passage of only a few drops of urine at a time. Violent pains in the bladder and back, with retracted left testicle. Pains from thighs, shooting into the feet.

Phosphorus (3x). — Urine scanty and turbid, whitish like curdled milk, with brick-dust sediment, and variegated cuticle on the surface. (Phosphaturia.)

Sarsaparilla (3x).— Urine passed with difficulty, and containing mucus, pus, gravel and small calculi. Urine pale when passed, but becoming turbid on standing, and depositing a sandy sediment.

Sepia (6x).— Turbid urine with sediment of red sand. Urine reddish, with white sediment and pellicle on the surface. Urine offensive with white sediment.

Tabacum (2x).— Constant deadly sickness of the stomach and retching, with cold perspiration; violent, colicky pains in the region of the ureter, right or left side.

Uva ursi (1x).— This remedy produces an inflammatory irritation of the mucous membrane of the bladder and urethra, with tenesmus and bloody and purulent urine. It is of service when these conditions are dependent upon the presence of calculi.

Dilute *hydrochloric acid*, fifteen drops in a glass of water before meals, is especially useful in oxaluria.

Nitric acid, given in a similar manner, is useful in oxaluria, and

will sometimes clear the urine of uric acid. *Magnesia phos.* (6x), as well as *Phosphorus* (3x) and *Phosphoric acid* (1x), is useful in phosphaturia.

PERINEPHRIC ABSCESS.

Synonyms.—Perinephritis, Paranephritis.

Definition.—Suppurative inflammation of the connective tissue about the kidney.

Pathology.—At autopsy the kidney is found surrounded by pus, which is usually behind the kidney, rarely in front between the kidney and the peritoneum. The pus has often a fecal odor from contact with the large bowel. Usually the abscess is very large. The pus may burrow in various directions, and even burst into the pleura and be discharged by the lungs, more often it may work its way to the groin and appear at Poupart's ligament. It in turn may perforate the bowel, or rupture into the peritoneum, bladder or vagina. Occasionally the fatty bed of the kidney is found to be converted into a fibrous capsule fused more or less closely with that of the true kidney capsule.

Etiology.—Perinephric abscess may result from traumatism, or develop secondarily from a purulent pyelo-nephritis or pyonephrosis. It may also result from perforation of the intestine, especially the appendix, from extensive suppuration of the spinal column, from hepatic abscess, and from empyema. It may also follow as a sequel of infectious diseases, such as typhus fever, smallpox and pyemia.

Symptoms.—A dull, throbbing pain and tenderness in the region of the kidney, are the most constant symptoms. Sometimes this is not present, no symptoms preceding the first signs of a deep-seated suppuration. If the abscess be large and press on the large nerve trunks, there may be numbness and shooting pains in the leg of the affected side. The pain is somewhat relieved by keeping the body immovable and by flexing the thigh. In rare cases the pain may be altogether referred to the hip joint or to the knee. The patient is weak and prostrated and frequently, but not always, the constitutional symptoms of an internal abscess are present,—chills, fever, and gradually developing sepsis. Sooner or later there is a peculiar edematous or boggy condition in the region of the kidney which pits on pressure. The abscess may appear externally, or internal rupture in any direction may occur.

Diagnosis.—The presence of a tender, indurated, edematous and sometimes fluctuating mass in the renal region, with the symptoms above mentioned ought to be sufficient for diagnostic purposes. If the abscess burrows to any extent, its primary source can not always be

ascertained. If connected with a suppuration of the kidney, there will be pus in the urine, but otherwise not. It may not be distinguished from cases of hip-joint disease, but the pain in its incipency being higher up, while examination shows that the swelling and the tenderness are above the hip and not over the hip joint itself. In all doubtful cases the aspirator-needle should be used.

Prognosis. — If the abscess points externally in the lumbar region, the prognosis is usually favorable. Internal rupture in any direction is a serious occurrence.

Treatment. — While it is important that there be an early and free incision and drainage, yet, as in other suppurative inflammations, much can often be accomplished in the early stages by the use according to indications of *Belladonna* (3x), *Merc. sol.* (3x), *Hepar sulphur* (3x), and possibly *Arnica* (2x) and *Rhus tox* (3x.)

II. DISEASES OF THE BLADDER.

CYSTITIS.

Synonyms. — Catarrh of the Bladder, Vesical Catarrh.

Definition. — An inflammation of the mucous membrane of the bladder. It may be either acute or chronic in its course.

Acute Cystitis.

Pathology. — There is first hyperemia of the mucous membrane of all or a portion of the bladder, manifested by redness, swelling and edema. This is followed by an increased secretion of thick tenacious muco-pus, and denuded areas from desquamation of the vesical epithelium, which often hangs in shreds from the bladder wall. At these points there is often rupture of the capillaries and hemorrhagic extravasations. In severe cases suppurations of the submucous connective tissue may result, and ulceration of the mucous membrane permit the submucous abscesses to empty into the bladder. This constitutes the so-called phlegmonous cystitis. In rare instances the entire bladder wall is involved in the suppurative process. Croupous or diphtheritic cystitis may occur, in which the morbid anatomy is the same as when these varieties of inflammation attack other mucous surfaces.

Varieties and Etiology. — Acute cystitis may be divided into four varieties according to the nature of the originating cause.

(1) *Catarrhal.* — This is the most common form, and does not differ etiologically from catarrhal inflammations of other mucous surfaces. The most common cause is exposure to extremes of cold, or by getting wet, especially when overheated, or sudden changes of tempera-

ture. It may also be caused by the extension of inflammatory processes in neighboring organs, or result from the pressure of an enlarged prostate or other tumor. It may result from retention of urine, being due either to the overdistention of the bladder or to the irritant influences of the decomposed urine in prolonged cases.

(2) *Septic*. — This variety is due to the direct or indirect introduction of pus-producing germs into the bladder. This is most often the result of the passing of a sound, bougie or catheter that has not been made aseptic. This variety also includes gonorrheal cystitis, as well as those cases that occur in the course of acute infectious fevers. In the latter, according to Fitz, the cystitis is probably a direct result of the presence in the urine of the casual bacilli or their toxins. The same occurs also in gout, rheumatism and tuberculosis.

(3) *Toxic*. — This variety is caused only by the ingestion of certain irritating drugs having a special affinity for the bladder, notably cantharides; also copaiva, cubebs, terebinthina, etc.

(4) *Traumatic*. — Traumatic cystitis may result from external injury, but is more often due to direct injury from the careless or improper use of instruments in the bladder, more especially the sound or catheter. It may also arise from the irritation of vesical calculi or other foreign bodies or morbid growths within the bladder.

Symptoms. — In many cases the first symptom noticed is a frequent desire to urinate. This becomes rapidly painful, the urine is voided drop by drop, its passage being followed by distressing vesical tenesmus, the result of spasm of the bladder. There is intense pain over the pubis and in the iliac regions often extending to the end of the penis. It is of a dull character, at times becoming sharp and agonizing. Burning along the urethra also adds to the distress of the patient. An associated rectal tenesmus is frequently present. The pain referred to is usually worse before urination, by which it is relieved. It is usually better in the recumbent posture and worse from pressure. There is not often fever, but it may be present in a moderate degree, and in severe cases, especially of the septic and diphtheritic varieties, there may be rigors and a very high temperature. The urine is usually cloudy and highly colored, often containing blood, mucus, pus, shreds of epithelium and numerous micro-organisms. The mucus and pus combined impart a glairy, stringy character to the urine, which increases the difficulty of its discharge from the bladder. The reaction of the urine when passed is commonly either alkaline or faintly acid, and if acid, it soon becomes alkaline. More or less albumin is present, and on standing, a dense sediment forms at the bottom of the vessel. In advanced stages sepsis may develop from the absorption of retained putrid matters or from

suppuration. Abscesses may form and discharge through the bladder, or open into the peritoneal cavity and induce septic peritonitis. When there is exfoliation of the mucosa, typhoid and uremic symptoms may develop.

Diagnosis.—The diagnosis is usually easy. No other disease presents the constant symptoms of supra-pubic pain and vesical tenesmus. Cystitis is most liable to be confounded with pyelitis. The latter has lumbar pains following the course of the ureters, tenderness over the renal region, frequent micturition without the severe vesical tenesmus; the urine, although cloudy, has an acid or neutral reaction.

Prognosis.—The prognosis is almost always good. Septic and diphtheritic cystitis offer a grave prognosis. An extension of the disease upward toward the kidneys is always a serious matter. Oft-repeated cases frequently result in chronic cystitis.

Treatment.—Rest in bed until the vesical tenesmus ceases is indispensable. The patient should be encouraged to drink large quantities of distilled water and other bland diluent drinks. The diet must be restricted, all animal foods and highly seasoned articles being particularly interdicted; milk is the most suitable article, an absolute milk diet being the most desirable. Alcohol in all forms must be prohibited. Hot fomentations and hot poultices over the bladder and hot sitz baths greatly relieve the pain and tenesmus. All local treatment of the bladder must be avoided. In case of an associated violent rectal tenesmus a suppository containing an opiate, or a mild starch and laudanum injection can be employed, provided the distress can not be relieved by less objectionable means. Sometimes pledgets of ice in the rectum give great relief. According to Hale, "Two of the best palliatives of the agonizing pain in cystitis are corn-silk (*stigmata maidis*) and hydrangea in doses of ten to twenty drops of the tincture every hour or two.

Therapeutics.—**Aconite** (2x) is often useful in the early stages especially when there are chills, high temperature, full pulse, great anxiety and restlessness. Urination painful, difficult, drop by drop; urine scanty, scalding hot, red or dark colored.

Cantharis (3x).—This is the remedy most universally employed. No doubt it is oftenest indicated and in a general way most useful, but it is frequently prescribed where other remedies would act better. Violent pains in the bladder, with frequent urging; intolerable tenesmus; strangury. Violent burning, cutting pains in the neck of the bladder, extending to navicular fossa of urethra. Passage of blood from urethra. Violent burning, cutting pains in urethra before, during, and after urination. Urine scalding; passed drop by drop.

Gelsemium (1x).—This drug is recommended, as the first remedy

as the first remedy to be employed on general principles. Its pathogenesis does not correspond closely with acute cystitis, yet it may be indicated by the general constitutional disturbances, when the characteristics of Aconite are not present.

Terebinthina (1x) is often useful when there is much vesical irritability, which Cantharis does not control. Strangury, with bloody urine; violent burning in the bladder and urethra.

Cannabis sativa (1x) is most useful in gonorrheal cystitis. Burning, smarting in the urethra, from the meatus backward; posteriorly stitching while urinating. The urethra feels inflamed and sore to touch along its whole length. Burning while urinating, but especially just after.

Merc. cor. (3x) is often valuable in severe cases associated with much rectal tenesmus, and where the inflammation seems destructive in its tendency; also in gonorrheal cases. Tenesmus of the bladder; urine suppressed. Frequent urination, passed in drops, with much pain. Urine scanty, bloody; albuminous, containing filaments, flocks, or dark flesh-like pieces of mucus.

Apis (3x) is by many considered as only secondary to Cantharis in its usefulness. Burning soreness when urinating. Frequent desire, with passage only of a few drops. Urine scanty and high colored. Urine suppressed.

Belladonna (3x).—Hypogastrium painful to pressure; frequent, painful urination; urine hot, scanty and dark red; urine at first clear, but soon becomes turbid on standing, and deposits a red, bran-like sediment.

Nux vomica (3x) is especially indicated in cases occurring in those of sedentary habits, who have dyspepsia and constipation. Painful, ineffectual urging to urinate. Urine passes in drops, with burning and tearing in urethra and neck of bladder. Urine pale; later thick, whitish, purulent; reddish, with brick-dust sediment.

Chimaphilla (1x) is especially useful in chronic cystitis, but I have obtained most valuable results from it in the acute variety. It seems especially useful in those cases where Cantharis appears to be indicated, but does not act well. The urine is high colored, offensive, turbid, and containing considerable ropy or bloody mucus, and depositing a copious mucous sediment, burning and scalding during urination; great straining before and after.

Equisetum (1x).—Said to be especially useful for dysuria in women, and has long been employed as a domestic remedy for urinary troubles. Urgent desire to urinate. Pain in bladder, as if distended; not relieved by micturition. Pain and tenderness in region of bladder.

Excessive burning in urethra while urinating. Sharp, cutting pain in the urethra. Constant desire to urinate. Constant urging, with scanty discharge. Urine high colored and scanty. Urine deposits a mucous sediment. Urine shows great excess of mucus after standing a short time.

Chronic Cystitis.

Pathology.—The mucous lining of the bladder presents a muddy or slate colored appearance, with dots or streaks of blackish blood and patches of erosion or ulceration, often leaving exposed the muscular layer. These changes are usually confined to the neck and base of the bladder, but in severe cases may involve the entire inner surface of the organ. Permanent thickening of the walls may result. From increased activity, the result of continual straining, the muscular fibers become hypertrophied, causing a "ribbed" appearance of the walls. This, together with the thickening, results in contraction and narrowing of the lumen of the bladder and diminution in its capacity. In other cases, where thickening does not take place and the muscular hypertrophy is eccentric, the organ becomes dilated, its capacity being sometimes greatly increased. A polypoid protrusion or sacculation of the mucosa between the muscular fibers may occur. The ureters may become obliterated, or partially obstructed at their orifices, and, as a result, dilatation of the ureters and the pelvis of the kidney follow. There is more mucus and pus present in the urine than in the acute variety, and it is always alkaline, but otherwise it does not differ from the urine present in acute cystitis.

Etiology.—Chronic Cystitis may follow one or more acute attacks, but usually it is chronic from the beginning, and may result from the presence of a calculus or some other irritating substance, or from stricture of the urethra, prostatic enlargement, tumor, or some other condition causing an obstruction to the flow of urine, or preventing the bladder from emptying itself. Displacement of the uterus pressing upon or dragging the bladder out of position, or localized inflammation of a displaced uterus may cause chronic cystitis. From whatever cause it may occur, the continual pressure of residual urine in the bladder will ultimately induce chronic inflammation. It may also occur in connection with, and as a result of, chronic Bright's disease and other organic disease of the kidneys.

Symptoms.—In cases secondary to other diseases there are often at first no distinctive symptoms save such as might result from the primary disease. In other cases the onset is frequently insidious, and its symptoms overlooked until the disease is well established. Com-

monly there is at first a frequency of urination with some pain in the urethra, a moderate pain or sense of discomfort in the region of the bladder, and a feeling of weight or pressure in the perineum. As the disease advances, the symptoms become more severe, approaching those of the acute variety, from which they do not differ save in degree. Pain and tenesmus are present, but are less intense, the dull, heavy aching pain and tenderness on pressure in the hypogastric region being the symptom of which the patient chiefly complains. The urine is alkaline, containing more albumin than in the acute variety and large amounts of muco-pus or pus; on standing, it deposits a thick, glairy, viscid sediment, in which, under the microscope, triple phosphates and large pus corpuscles, extremely regular both in contents and in shape, may be detected. Emaciation and debility gradually develop. Acute exacerbations are liable to occur from various causes, such as errors in diet, exposure to cold, excessive venery or the use of instruments.

Diagnosis.—The diagnosis is usually easy, though it is sometimes difficult to determine as to the causative condition. Pyelitis is often associated with chronic cystitis, and it is sometimes quite impossible to determine its presence. Tenderness and a tumor in the renal region are about the only certain signs. Distinct intermission in the purulent discharge, especially if associated with attacks of renal colic, point to pelvic disease. Severe local pain, emaciation, and occasional bloody urine indicate ulceration of the vesical mucous membrane.

Prognosis.—The course of the disease is always slow at best, and the prognosis grave, though much depends upon the character of the cause and the possibility of its removal before great organic changes have occurred. If there is ulceration and the ureters and kidneys have become involved, the patient usually dies from exhaustion. In many cases much can be done to relieve and life be much prolonged by judicious treatment.

Treatment.—In considering the treatment of chronic cystitis it must be remembered that a great difficulty in the way of successful medicinal treatment is the constant presence in the bladder of the urine with its irritating qualities, especially to an inflamed mucous membrane, as well as the retained and decomposing products of inflammation, which render the urine still more irritating by producing ammoniacal changes. For this reason the successful treatment of chronic cystitis requires not only, as in acute cystitis, the free use of diluent drinks to reduce the degree of irritating qualities in the urine, but it is equally important to irrigate the bladder, keeping it as thoroughly cleansed as circumstances will permit. For this purpose a graduated glass funnel can be attached to an aseptic soft rubber catheter. I sometimes use

an ordinary fountain syringe with a glass tip, instead of a funnel, as there is danger that the rubber syringe may not be aseptic. Plain sterilized water or a normal salt solution may be used, but I prefer a solution of boric acid, one drachm to one pint of sterilized water. Other favorite injections are: Merc. bichloride, $\frac{1}{1000}$; Potas. permang., $\frac{1}{1000}$; carbolic acid, $\frac{1}{100}$. The irrigation should be conducted slowly and kept up until the water comes away tolerably clear. Usually in ordinary cases once every second or third day is sufficient, but in some cases it may be necessary to repeat the process twice a day. It is often beneficial to immediately follow the irrigation by the introduction through the same instrument of a ten- or twelve-per-cent solution of colorless fluid hydrastis, which is allowed to remain a few moments, then pass away.

Several of the remedies already recommended for Acute Cystitis are of equal value in the chronic variety and the indications are the same as previously given, though, as a rule, they will serve a better purpose if given in somewhat higher attenuations than are recommended in the acute variety. These are *Canth.*, *Terebin.*, *Chimaphilla*, *Merc. cor.*, *Apis*, *Nux vom.*, and *Equisetum*. In addition to these consult also *Aspar.*, *Benz. ac.*, *Dulc.*, *Eucalyp.*, *Lycop.*, *Merc. sol.*, *Merc. cor.*, *Nitric acid*, *Parcira*, *Puls.*, *Rhus tox.*, *Sars.*, *Sulph.*, and *Uva ursi*.

VESICAL HEMORRHAGE.

Definition. — Hemorrhage from the bladder.

Etiology. — Vesical hemorrhage may be caused by nephrolithiasis and carcinoma and tuberculosis of the bladder, and may occur in the course of leukemia and malaria. It may also occur from a hemorrhoidal state of the veins, especially in old people. In such cases the hemorrhage may be copious but very rarely proves fatal.

Diagnosis. — The diagnosis of vesical hemorrhage depends chiefly upon the presence of those causes which have already been mentioned. Hemorrhage from a hemorrhoidal state of the veins can only be positively established by the use of the endoscope. The *prognosis* depends upon the cause. Hemorrhoidal cases rarely prove fatal.

Treatment. — The treatment is that required for the cause. Hemorrhoidal cases in most instances should receive Hamamelis both internally and locally. For the latter purpose the distilled extract largely diluted, may be used as described for such treatment under chronic cystitis.

ENURESIS.

Synonym. — Incontinence of the Urine.

Definition. — An inability to retain the urine. The term is usually applied only to such cases as are purely idiopathic or functional in character.

Etiology. — Enuresis is a symptom arising in the course of many ailments. It is of frequent occurrence in children, sometimes, no doubt, arising from habit, but in most cases due to some local irritation of the genito-urinary system. This may be an elongated prepuce, phimosis, adhesions, ascarides, smegma about the glans or clitoris, contraction of the meatus and masturbation. In such cases the incontinence is chiefly at night and is termed nocturnal enuresis. The latter may also be a manifestation of nocturnal epilepsy or of incipient cerebral or spinal disease (Fitz). Many cases in both children and adults, but especially the former, arise from rectal irritation, fissures, ascarides, and hemorrhoids. Other cases arise from errors of refraction and muscular inequalities of the vision. Nocturnal enuresis is always a neurosis, and occurs in those of highly neurotic temperaments. Paralytic enuresis is the result of some lesion of the spinal cord. In such cases the urine dribbles away, and there are occasional spurts of urine when voluntary or involuntary muscular action is brought into play, as in the act of coughing, sneezing, or bending forward of the body. The latter often occurs from a local weakness of the bladder, especially in women, and may result from traumatism, or from reflex irritation of some sort, or during the menstrual period, displaced uterus, etc. Of traumatic causes, pressure of the fetal head in a prolonged labor is one of the most common. The habit, especially in women, of allowing the bladder to become overdistended, causing paresis of its walls, is a common cause. Spasmodic enuresis, so-called, is due to an overaction of the compressor muscle of the bladder, as a consequence of which there is a diminution of the vesical capacity, the urine being forcibly and involuntarily ejected at irregular intervals.

Treatment. — The treatment depends largely upon the cause, which must be discovered before successful treatment can be established. All sources of reflex irritation must be removed if possible. In all cases hygienic measures are of utmost importance. Nourishing, easily digested food, exercise in the open air, regular habits, and a systematic evacuation of the bladder, and cold sponging of the body in the morning, followed by brisk friction. The supper should be light, little water or other fluids drunk in the evening, and it is a good plan to use a rectal enema before retiring, especially if there be constipation,

Causticum (30x). — This is the most universally successful remedy. It seems to act better in boys than girls, and where no reflex causes can be discovered. It is especially useful also in adults, particularly women, when, not from organic spinal disease, there is a spurting of the urine when coughing, sneezing, or blowing the nose.

Pulsatilla (30x). — Nocturnal enuresis particularly in little girls. Dribbling of the urine while sitting or walking.

Equisetum (3x). — An excellent remedy in nocturnal enuresis of children; also in weakness of the bladder, incontinence of urine, dribbling, especially in old men and insane people.

Belladonna (3x to 30x). — Children who start in their sleep; restlessness, moaning and screaming during sleep. This remedy is almost universally employed by the old school.

Ignatia (30x). — In hysterical women and children.

Cina (3x). — In children, from intestinal irritation, especially worms. *Santonine* sometimes acts better.

Gelsem (2x). — Nervous women and children. From paralysis of the sphincter vesicæ.

Sulphur (30x). — In long-standing chronic cases sulphur is of inestimable value. Pale, lean children with large abdomen, who love sugar and highly seasoned food, and abhor to be washed. (Raue.)

RETENTION OF URINE.

The urine may be retained from various organic and mechanical causes, such as calculi, stricture, tumors, etc., but, in this connection, only those cases are referred to that result from nervous influences and which occur in neurotic individuals, especially those suffering from hysteria. In many such instances there is only an inability to urinate in the presence of others. A frequent cause of retention is childbirth, the pressure of the head during a prolonged labor, causing paralysis of the bladder walls and a consequent inability to contract upon their contents. It may also be due to a nervous reaction following an exhausting labor. The same causes that have been noted under enuresis may also cause spasm of the bladder, and result in retention of the urine.

Treatment.— When a bladder is overfilled from any cause, with inability to urinate, the catheter should be used, and its use repeated so long as required to prevent distention. Electricity is often of benefit, one pole being placed over the lumbar region and the other over the pubis. In purely nervous cases the sound of running water will sometimes aid in causing the urine to flow. In cases due to reflex causes

these must if possible be discovered and eliminated. The general treatment of the nervous condition of the patient must not be overlooked.

The remedies most often required are:—

Aconite (2x). — Retention from cold, especially in children, with crying and restlessness.

Ambra (6x). — Especially in nervous women, and particularly in the lying-in room, where the patient can not urinate when any one else is in the room.

Apis (3x). — One of our most valuable remedies when used in a low dilution or trituration. Especially useful when the urine is suppressed.

Helleborus (3x). — Bladder overdistended; retention of urine from atony of muscular coats.

Hyoscyamus (3x). — Of great value, especially after confinement, when the patient has no desire to urinate.

Belladonna (3x). — In plethoric individuals, especially children, the urine passes only drop by drop, spasm of the sphincter vesicæ.

Cantharis (3x). — Retention with much pain, fruitless efforts to urinate, intolerable tenesmus and strangury.

Stramonium (2x). — Characteristic mental symptoms, retention or suppression of urine from irritation of the brain.

SECTION V.

DISEASES OF THE BLOOD AND DUCTLESS GLANDS.

I. DISEASES OF THE BLOOD.

ANEMIA.

Definition. — A deficiency of the blood, or of one or more of its constituents, the latter being the condition for which the term is most often used.

Varieties and Pathology. — Anemia may be local or general. The former is known as ischemia, and is not a true anemia. It is that condition present in a fainting person, causing the well-known pallor, and is present in Raynaud's disease. (See Diseases of the Nervous System.) General anemia may be either primary or essential and secondary. Primary anemia results from a direct defect in the blood-making processes, and includes simple anemia, chlorosis, and pernicious anemia. Secondary anemia results from the loss of blood or some of its constituents, or from a deficient supply of blood-making material. In this class belong anemias due to hemorrhage or other drain upon the system, deficient food supply and indigestion; also the toxemias, lead poisoning, uremia, etc. Leukocytosis, leukocythemia and lymphatic anemia or Hodgkin's disease are also forms of anemia.

When anemia results from a deficiency in the quantity of blood, it is termed oligemia; when there is a deficiency in the number of red corpuscles, it is known as oligocythemia; when there is a deficiency of hemoglobin, oligochromemia; when other constituents are deficient, anhydremia. "The diminution of hemoglobin gives rise to the most obvious sign of anemia or impoverished blood,—namely, the pallor of the cutaneous surface,—but it is important to point out here that the quantity of hemoglobin in the blood is not necessarily propor-

tionate to the number of red corpuscles. Thus the percentage of hemoglobin contained by the red corpuscles may vary in disease, so that a reduction in its amount does not necessarily involve a corresponding decrease in the number of red corpuscles. Conversely, a diminution in the number of the latter may not be accompanied by a proportionate diminution in the amount of hemoglobin, the corpuscular richness in coloring-matter being quite normal. As a matter of fact it frequently happens that oligochromemia is associated with a certain degree of oligocythemia, and *vice versa*, though, where they coexist, the degrees of reduction may neither be relatively nor proportionately equal.

"Anemia can be positively ascertained only by an adequate examination of the blood. It may be inferred from the presence of pallor, languor, dyspnea, palpitation, etc.; but it should be borne in mind that not every pale person has anemia, since pallor of the face may be hereditary, and, at the same time, perfectly consistent with good health, a normal number of corpuscles, and a normal percentage of hemoglobin. Conversely, a person with marked vascularity of the face, and a rosy complexion even, may have anemia.

"The anemias embrace those conditions, also, in which there are changes in the shape of the red corpuscles (*poikilocytosis*), and in their size (*micro-, macro- or megalocytosis*)." (Anders.)

THE PRIMARY OR SIMPLE ANEMIAS.

Simple or Benign Anemia.

Etiology.—Primary simple anemia may result from lifelong dwelling amidst unsanitary surroundings, breathing only a vitiated atmosphere in dark, crowded tenements, and having only a deficient supply of unwholesome food. It is therefore found mostly among the poorer classes of the large cities in whom from such causes the general health is reduced and poverty of the blood results. The children born under such conditions are anemic from birth, and carry with them through life the pallor and general weakness characteristic of an impoverished constitution. In other cases a constitutional anemia is present from infancy due to some not-understood defect in the blood-making organs. The same condition may come on later in life from an acquired functional or organic defect, or weakness, and yet without evidences of disease of the blood-making or other organs.

Symptoms and Diagnosis.—Pallor and weakness are the chief symptoms, though such persons often lead a more or less active life. There is an entire absence of the usual physical signs and symptoms of organic or functional disease. There may be some palpitation, dyspnea

and headache, with a more or less constant sense of languor and fatigue, but these are due only to the poverty of the system. When with these symptoms there is considerable indigestion, care must be taken to ascertain if possible whether the latter is due to the anemia, or, as is more often the case, to the primary disease. The history of the case must be carefully considered in order to exclude all functional and organic diseases, symptomatic anemia being often one of the early and constant symptoms of an incipient or latent tuberculosis, carcinoma or nephritis.

The *prognosis* is favorable, though from the danger of a possible error in diagnosis as to the benign character of the anemia, it should always be judiciously guarded. If there is present any congenital defect, there can be no hope of a cure, though the patient may live many years, and enjoy an active life.

Treatment.—In simple anemia, the greatest benefit is to be derived from rigid hygienic measures. Regular habits, moderate and systematic exercise, plenty of fresh air and sunshine, and nourishing, easily digested food are of absolute necessity. For medicinal treatment see *Therapeutics of Anemia*, page 528.

CHLOROSIS.

Synonyms.—Green Sickness, Chloroanemia.

Definition.—An essential anemia occurring chiefly in girls at about the age of puberty, and characterized chiefly by a marked relative reduction of the hemoglobin in the red corpuscles.

Pathology.—Other than the changes in the blood, there are no morbid changes to be found post-mortem, though deaths from chlorosis are so infrequent that little data is known. Many years ago Virchow pointed out a hyperplasia of the arterial system, many arteries being congenitally small. According to Rokitansky, incurable cases of chlorosis are nearly always characterized by anomalies of the blood vessels and genitalia. The body is usually well nourished, and the subcutaneous fat well distributed. There is pallor of the organs and muscular system. Imperfect development of the uterus and other genitalia has been noted. The essential blood change consists in the reduction of hemoglobin. In average cases the hemoglobin falls to 40 per cent, in severe cases to 20 per cent. The number of the red cells may be normal, although, as a rule, they are considerably reduced, but never to the same proportional extent as the hemoglobin. The character of the red cells is also changed, not all being of uniform size, some normal, others small (microcytes), others unusually large (macro-

cytes), others irregularly shaped (poikilocytes). The white corpuscles are usually normal in number, but in some instances their number is increased (leukocytosis).

Etiology.—Chlorosis is found almost exclusively in girls between sixteen and twenty, though it may occur in those both younger and older. It is more frequent in blondes than in brunettes, and in the weak and delicate rather than the strong and vigorous. Rarely the disease is present in males, and is then simply a modified anemia, and not a true chlorosis. Heredity undoubtedly exerts a causative influence, as mothers who were chlorotic in youth are quite apt to beget chlorotic daughters. Menstrual irregularities seem closely associated with chlorosis, either as cause or effect. In many cases there is a history of precocious development, and the early appearance of the menses; in other cases the menses may be retarded. The disease is especially frequent in overworked factory girls, who live amid poor hygienic surroundings, and who work hard upon insufficient or improper food; but cases among the upper classes are not uncommon. Prolonged lactation, profuse menstruation, or other drains upon the system may have a causative influence. The cultivation of the emotional life, and especially erotism and masturbation act as causes of chlorosis. Grief, homesickness, disappointed love, and other depressing conditions act in the same manner. Sir Andrew Clark attributed chlorosis to a blood-poisoning from the absorption of toxic products from a constipated bowel. Such poisons may readily interfere with the proper development of the hemoglobin of the blood disc without in a great degree causing its destruction. Many cases seem to come on spontaneously, and without any apparent cause. Hammond maintains that chlorosis is an affection of the nervous system, the blood changes being secondary.

Symptoms.—The first symptoms noticed are those indicating a change in disposition, the patient becoming morose, despondent, or capricious, vibrating from an extreme of high spirits to corresponding depression, but low spirits is the habitual state of the largest number. With these is a constant sense of languor, weariness, mental and physical indisposition, and loss of energy. Seldom is the patient troubled with erotic fancies and feelings, but in rare cases nymphomania is present. Hysteria sometimes occurs, but is not by any means a constant symptom. There is often present vertigo, headache, dyspnea, palpitation, and irregular heart action, muddy, grayish coloration, with bluish-black rings under the eyes. Physical examination will sometimes discover functional cardiac murmurs; also a systolic murmur at the apex, ascribed by Balfour to a relative insufficiency of

the mitral valve due to dilatation of the left ventricle. Sometimes a *bruit de diable* or venous murmur, may be heard over the right jugular. Dyspepsia and constipation are present in a majority of cases. The appetite is usually perverted and capricious—now satisfied with difficulty, now indifferent to food, but characterized by sudden desire for unusual articles, or by craving for pickles, slate-pencils, chalk, or bits of earth. The tongue is usually pale, flabby, often dry, and the edges show indentations. Usually the above symptoms are preceded or soon followed by menstrual derangement, the menses becoming either scanty, irregular or entirely absent on the one hand, as is most often the case, or the flow is excessive, attacks of menorrhagia occurring each month and sometimes oftener. Soon after the manifestation of menstrual derangement, there gradually sets in the distinctive appearance that has given rise to the term “green sickness.” This consists in a peculiar pallor, often exhibiting a yellowish-green tinge, extending to the lips and especially the mucous membranes. There is no emaciation; on the contrary the patient is fat and presents a puffy appearance, but there is no edema. In the case of brunettes there is a muddy, grayish coloration, with bluish-black rings under the eyes. The peculiar complexion can readily be distinguished from the muddy pallor of cancerous anemia, from the lemon-yellow tint of pernicious anemia, from the saffron hue of jaundice, and from the blanched pallor after severe hemorrhages. The scleroticæ usually present a glistening pearly or bluish-white appearance. The skin is often cool and the extremities cold, from feeble heart action. Gastralgic attacks are frequent and severe, often indicating the presence of a gastric ulcer. Edema of the ankles is observed in many cases.

Diagnosis.—When the characteristic complexion is present in a girl with menstrual derangement, there can be little question as to diagnosis, though the blood should be examined to make it certain. The heart, lungs and kidneys should receive careful attention in order to exclude any primary organic disease of these organs.

Prognosis.—The prognosis is always favorable except in cases complicated with either congenital or acquired vascular changes. However, relapses are not unusual, sometimes occurring after the thirtieth year of age. In rare instances phthisis develops, and gastric ulcer is an occasional and sometimes fatal complication. According to Virchow, chlorotic patients are liable to suffer from malignant ulcerative endocarditis during pregnancy and the parturient state.

Treatment.—Hygienic measures are of the utmost importance in the treatment of chlorosis. Plenty of fresh air and sunshine; moderate exercise, if not too weak; a generous diet of nourishing, easily digested

food; plenty of rest and sleep; regular habits and agreeable surroundings, are absolutely essential to a perfect cure. Cases occurring in girls who sew, or are employed in factories, stores, or other occupations involving close confinement, rapidly recover on changing to an outdoor occupation. City girls are often cured by going to the country, especially to mountainous or seaside resorts. Sun baths—exposure of the whole body to the sun's rays in a solarium—are of inestimable value. The diet should consist of milk, eggs, meat, fish, poultry, cereals, vegetables and fruits. Fats and sweets and tea, coffee and alcoholic drinks should always be avoided. The bowels should be kept regular, and any tendency to constipation should receive prompt attention. For the medicinal treatment of chlorosis, see Therapeutics of Anemia, page 528.

PERNICIOUS ANEMIA.

Synonyms.—Progressive Pernicious Anemia, Idiopathic Anemia, Essential Anemia, Malignant Anemia.

Definition.—A grave form of anemia, progressive in its character and usually fatal. Causative or associated lesions are seldom present. The term "pernicious anemia" is usually made to include all cases of anemia running a progressive course, and which are not due to any evident cause.

Pathology.—The alterations in the composition of the blood are similar to those of anemia, but they are more extensive and profound. The volume of the blood is lessened, the red corpuscles are fewer, the albuminates of the blood diminished, and the fibrin is deficient. It is characteristic of pernicious anemia, that each red corpuscle remaining in the blood carries its normal, or even more than its normal, load of hemoglobin, though the total amount of hemoglobin is much reduced. The majority of the red corpuscles are much enlarged, and usually irregular in shape, being crescentic, conical, and otherwise distorted. Nucleated red corpuscles are a constant constituent of the blood of pernicious anemia, and, when present in large numbers, are considered as pathognomonic. Two kinds are found: first, the small, normal-sized corpuscle, with its deeply stained nucleus, and certain large forms with pale nuclei. The leukocytes are usually diminished in number.

The skin is anemic, and usually presents a lemon-yellow tint. Most of the organs and tissues are anemic, except the muscles, which are usually *red*. Fatty degeneration is a striking feature, the liver, heart, kidneys, and the intima of the smaller blood vessels being especially involved. Extravasations of blood are common, being most frequent in the serous membranes and in the retina. Ecchymoses may

be found on the skin and mucous membranes. The lymphatic glands may resemble spleen pulp in consistency and color. There is more or less general edema, but mostly about the ankles, and there are often dropsical effusions into the serous cavities. The deposition of iron pigment in the liver cells is characteristic of pernicious anemia, and the same is also found, though to a much less extent, in the spleen, pancreas, kidneys and other organs. A very interesting and characteristic feature is the increase of lymphoid and nucleated red cells in the bone marrow, causing the latter to resemble the red marrow of childhood, thus presenting a striking contrast to the icteric pallor of other tissues.

Etiology.—The primary causes of pernicious anemia are unknown. It usually occurs in adults, and in most instances in women; especially in those who have been repeatedly pregnant or subjected to debilitating influences, as uterine hemorrhage, or to bad hygiene. The reason for this has never been established. Adult males are liable to the disease, and cases occurring in children have been reported.

Symptoms.—The disease is seldom sudden in its onset. It usually develops insidiously, beginning with a gradually progressive weakness which after a time develops into an extreme debility until the patient is prostrated, unable to leave the bed, and faints on attempting to assume the erect posture. There is no emaciation or appreciable loss of weight. At first a gradually increasing pallor appears, which later assumes a yellowish hue, often causing the condition to be mistaken for jaundice, and especially for yellow atrophy of the liver, which disease it also resembles in some other respects. The mucous membranes, however, are blanched, the lips, gums and mouth being decidedly pale. Early in the disease there is shortness of breath and palpitation of the heart, especially on exertion. There is no appetite, often a disgust for food, and nausea, vomiting and diarrhea are often troublesome symptoms. Various local hemorrhages take place, as epistaxis, bleeding from the gums, menorrhagia, extravasations under the skin and into the retina. The hemorrhages into the retina are very common, and consist (ophthalmoscopic examination) of small, blackish, brownish, or yellowish-brown spots, or larger patches covering more or less of the fundus. Small extravasations or larger hemorrhages may take place in the brain, with the usual results. Hemitic murmurs, visibly pulsating and throbbing arteries, even pulsating veins, have been noticed. An irregular temperature develops from time to time—usually 100° or 101° F., more rarely from 102° to 104° F. At other times the temperature may be subnormal. The urine is of low specific gravity and of high color, and it contains an excess of urobilin. The pigmentation of the urine, however, is not constant. Dropsical swell-

ing of the ankles attends the latter stages of the disease, and the dropsy may become general. Nervous symptoms, including numbness, languor, and even paralysis, are sometimes present.

Diagnosis.—According to Osler, the following are the essential points: (1) The severe grade of reduction in the number of the red cells; (2) their relative richness in hemoglobin; (3) the presence of many megalocytes and giantoblasts; (4) the absence of any cause for secondary anemia; (5) occasional febrile disturbances; (6) the yellow tint of the skin; (7) hemorrhages, particularly retinal; (8) a progressive course and the inefficiency of treatment.

Prognosis.—Pernicious anemia is always a grave disease, though the prognosis is established somewhat less unfavorable than formerly. The course of the disease is progressive, but periods of temporary improvement in the physical characteristics of the blood as well as in the general condition of the patient is not uncommon. In most cases death is preceded by prolonged and extreme prostration, stupor, mild delirium and irregular fever. Cases occurring in pregnant women are considered especially unfavorable.

Treatment.—Absolute rest in bed is indispensable. The diet should be light and nutritious. Massage is often of benefit. The same general hygienic measures recommended for chlorosis are equally desirable in most cases of pernicious anemia. Arsenicum is the chief remedy. From 2- to 10-drop doses of Fowler's solution after meals is said to most efficacious. Iron is seldom of benefit. Arsenic is highly lauded by the old school, who, however, fail to recognize the wonderful similiarity existing between the effects of the drug and the disease. Goodno suggests that *picric acid* and *picrate of zinc* produce symptoms simulating those of pernicious anemia, and should be borne in mind as possible remedies. For the indications calling for Arsenicum as well as for other possibly useful remedies, see Therapeutics of Anemia, page 528.

THE SECONDARY ANEMIAS.

Varieties and Etiology.—The usual and most convenient classification of secondary anemia is the following based upon the etiology: 1. *Anemia from hemorrhage.* This includes all forms of hemorrhage, however caused. The most frequent forms inducing anemia are traumatic hemorrhage, post partum hemorrhage, pulmonary hemorrhage, and gastric and intestinal hemorrhages. Rupture of an aneurysm, purpura hemorrhagica and hemophilia are not infrequent causes of anemia.

2. *Anemia from long-continued drain on the albuminous materials*

of the blood, as in chronic suppuration, Bright's disease, prolonged lactation, chronic diarrhea, or rapid growing tumors, as cancer.

3. *Anemia from inanition and defective nutrition*, as from insufficient or improper food, digestive disturbances causing malassimilation, obstruction of the esophagus or pylorus, by cancer or otherwise, improper modes of life, and intestinal parasites.

4. *Toxic anemia* results from the use of certain drugs, as lead, such as acquired by painters or workers in lead-paint factories, typesetters, and type founders, also from mercury, arsenic, salicylic acid, or from organic poisoning, as in syphilis, malaria, infectious diseases, tuberculosis and pyrexia.

It is possible that several causes may exist in one case, and it may be quite difficult to discover which of these is the active cause. In some instances the associated impairment of the blood-making organs is so evident that the anemia may assume almost a primary importance.

Pathology.—In most cases the blood changes differ from those of primary anemia. As a rule, the number of red corpuscles and the percentage of hemoglobin are proportionately diminished, and a relative, and often absolute, increase in the number of leukocytes, especially anemia following hemorrhage. In cases from hemorrhage the immediate loss of blood in bulk is rapidly made up by the absorption of water from the gastro-intestinal tract. The regeneration of red corpuscles and hemoglobin is usually a slow process, though in some instances it takes place rapidly. In anemia from inanition the quantity of blood is partly reduced, but it is the plasma that suffers rather than the red corpuscles. The latter are somewhat reduced in number, but often show a relative increase. In true toxic anemias the red corpuscles are probably directly destroyed by the poisonous agency, though it may be that only is their consumption increased in the usual manner.

Symptoms and Diagnosis.—Pallor of the face and mucous membranes is almost invariably present in anemia, but anemia may be present, as shown by other symptoms and physical signs when there is no pallor, and at the same time paleness does not always indicate the presence of anemia. In all cases a physical examination of the blood is necessary for an accurate diagnosis.

Other important symptoms are the muscular and mental weakness. There is a great lack of physical endurance and much mental apathy with loss of power to concentrate the mind. If cerebral anemia be present, there are spots before the eyes, buzzing noises in the ears, and vertigo. Dyspnea on exertion and cardiac palpitation show the secondary effects of the anemia upon the heart and lungs. Usually the pulse is rapid and weak and the heart action irritable. The appetite

and digestion are always impaired, the former being irregular and capricious. The tongue is usually coated and flabby and the bowels constipated. Various nervous symptoms are liable to be present. In some instances menstrual irregularities and hysterical phenomena are present. Most patients are restless and irritable. They are often sleepless by night, drowsy during the day. Various pains and sensations of a nervous character are liable to be present. The general physical signs are the same as those already described under primary or essential anemia. In making a diagnosis it must be remembered that the distinctive feature of secondary anemia is the coequal reduction of the red corpuscles and the hemoglobin, except, possibly, in toxic cases. Usually the history of the case and a physical examination render the diagnosis quite easy.

Prognosis.—This depends entirely upon the cause.

Treatment.—The most important essential of treatment is perfect hygiene and sanitation. Plenty of pure air and sunlight, airy sleeping apartments, wholesome food, pleasant surroundings and regular systematic rest and exercise are absolutely essential, and of far more importance than medicine. The chief remedies are Iron, Cinchona, Arsenicum, Chininum ars., and Phos. acid. For indications see Therapeutics of Anemia. The transfusion of blood, and the intra-circulatory injection of a normal salt solution, are satisfactorily employed for acute anemia following violent hemorrhage.

LEUKOCYTOSIS.

Definition.—A moderate and transient increase in the number of leukocytes, not accompanied as in leukemia, by splenic and true glandular enlargement or disease of the bone marrow.

Pathology and Etiology.—The increase in leukocytes is especially in those of the polynuclear variety, which normally constitute about three fourths of all the leukocytes. Normally the ratio of white to red corpuscles is 1 to 500, but in leukocytosis the proportion may be 1 to 150, or even 1 to 50. When the proportion becomes still greater, the condition is probably leukemia. Physiological leukocytosis occurs in infants, during pregnancy, and after hearty eating or excessive exercise. Pathological leukocytosis occurs secondarily to many diseases. Inflammatory leukocytosis occurs in acute inflammations, and acute infectious diseases with local exudations, as in pneumonia and diphtheria; also in pleuritis, peritonitis, pericarditis, erysipelas, and all suppurative processes. Leukocytosis does not accompany tuberculous diseases of serous membranes, and thus a

purulent meningitis can be distinguished from the tuberculous variety. Cachectic leukocytosis occurs in the cachexias of malignant tumors. Often in carcinoma the ratio of red corpuscles to white corpuscles is 25 to 1. Chemical irritants, such as turpentine, may produce leukocytosis. Relative leukocytosis occurs in anemia, where from diminution in the number of the red corpuscles, the white cells appear in an increased ratio, although they are not actually increased in number, as a rule.

The greater the resistance to disease, the greater the leukocytosis, and diminishing leukocytosis, during the height of a severe disease, usually indicates a diminishing resistance. "The object of the leukocytosis is naturally protective, beneficent and reparative."

LEUKEMIA.

Synonym. — Leukocythemia.

Definition. — A disease of the blood and the blood-making organs, characterized by a more or less permanent increase in the number of the leukocytes, and the marrow of bone, and by enlargement of the spleen and the lymphatic glands, together or separately.

Pathology. — The essential lesions of leukemia are found in the blood, the spleen, the lymphatic glands and the bone marrow. The blood changes are constant, but the changes in the other structures vary. Usually all are involved in varying intensity, while in other instances either the one or the other is alone implicated. A purely myelogenous leukemia is very rare, as is also to a less extent, a purely splenic variety. The two forms most commonly met with are (1) splenic myelogenous, or spleno-medullary, or lieno-myelogenous, and (2) lymphatic. The former, in which the spleen and bone marrow are involved, is the most frequent variety.

The blood changes consist in an enormous leukocytosis. The proportion of leukocytes to red corpuscles may range from 1 to 50 to 1 to 20 or even 1 to 5 or more, sometimes the cells being equal in number, in rare cases the leukocytes exceeding. The blood becomes pale and watery, sometimes the color of chocolate and milk. The red cells are diminished, but not to an excessive degree; hemoglobin is reduced to a somewhat greater proportion. Nucleated red cells may be seen. Charcot's octahedral crystals separate when blood slides are kept for some time.

In the splenic-myelogenous variety both the spleen and bone-marrow are affected. The spleen is enlarged, sometimes weighing as much as from eight to eighteen pounds, and the length varying from six to

twelve inches. In acute cases the spleen is soft and may rupture. In protracted cases the spleen is firm and resistant to the knife, and the capsule is often thickened and adherent to surrounding structures. On section hemorrhages may be found in its substance, and there may be seen grayish-white areas which consist of aggregations of lymphoid cells.

Lesions of the bone marrow occur rarely if ever without splenic enlargement. The marrow is either reddish-brown, yellowish, or greenish-yellow, or even purulent in appearance, and is rich in lymphoid and nucleated red blood cells. The lymphatic glands are more or less enlarged in splenic myelogenous leukemia. In lymphatic leukemia the lymphatic glands are alone involved. The histological change consists of hyperplasia of the glandular tissue. The glands are enlarged and soft, but are freely movable, and do not mat together. A hyperplasia also occurs in those glandular tissues that are allied to the lymphatic glands, such as the tonsils, lymph follicles, the tongue, mouth and pharynx, thymus gland, and the solitary and Peyer's agminated intestinal glands. There are also new foci of lymphatic tissue in various organs, as the liver and kidneys (which are enlarged), the liver sometimes attaining great size. Hemorrhages may occur in various parts of the body, especially under the skin, under the serous and mucous membranes and in the retina.

Etiology. — The cause of leukemia is not definitely known. Modern writers endeavor to assume its microbic origin, but there are no confirmatory proofs. Vehsemeyer holds the disease to be due to auto-intoxication by toxic albuminoids. "It is likely that the direct cause of the leukocythemia is a simple increase of the cytogenic function of one or more of the hematopoietic organs." (Anders.) In about thirty per cent of the cases there is a history of malarial poisoning. Most cases occur during middle life, though no age is exempt. Heredity probably plays some part in the etiology. Males are affected oftener than females. In the latter it appears most often at the climacteric and after pregnancy.

Symptoms. — Leukemia may occur, though rarely in an acute form, in young people who have previously enjoyed good health. The onset is sudden and characterized by great prostration, high fever and hemorrhages from mucous surfaces. A splenic tumor develops rapidly, the lymphatic glands usually enlarge, there is palpitation, dyspnea, nausea and vomiting, with other gastro-intestinal disturbances. The leukocytes increase rapidly, and, in the lymphatic variety, lymphocytes are very numerous. The case grows rapidly worse, hemorrhages take place in the brain and retina and vomiting of

blood occurs, and "petechiæ supervene perhaps, and the clinical features may then resemble an infectious disease with hemorrhagic and purpuric manifestations." In chronic leukemia, as ordinarily observed, the onset is slow and insidious as in pernicious anemia, with same class of symptoms,—pallor, rapid breathing amounting to dyspnea on exertion, weakness and faintness, headache, loss of appetite and indigestion. Emaciation is ultimately added. In exceptional cases these symptoms are preceded by an enlarged spleen, and in some cases hemorrhagic symptoms mark the early progress of the disease. Hematemesis may be an early and fatal symptom. Moderate fever with rapid pulse is also present in the majority of cases, the temperature sometimes reaching 103° F. The fever may be continuous or alternate with irregular periods of apyrexia. Headache is almost invariably present. Hemorrhages from the nose and stomach are common, and dropsical swelling occurs toward the close. Hemorrhages from the stomach are sometimes fatal. Epistaxis is common and sometimes quite obstinate, and bleeding from the gums and mucous membranes, and retinal and cerebral hemorrhages often occur. Petechiæ spots are not unusual. The most frequent hemorrhages arise from the nose, stomach, intestines, lungs and kidney. In males persistent priapism may occur, and may be the first symptom of the disease. The urine may be albuminous; uric acid is usually increased. Edema of the feet and general dropsy are commonly present. There are few symptoms indicating changes in the bone marrow. Pain in the bones is quite rare. If the sternum or long bones be affected, some tenderness may be manifest on pressure.

The lymphatic glands may be somewhat enlarged in the splenic forms of leukemia. In the lymphatic variety they are both visibly and palpably enlarged, but seldom present the same large bunches as in Hodgkin's disease. They are soft and movable and rarely painful. Superficial glands are usually first involved, next in frequency the retroperitoneal and mesenteric glands. Such cases usually run a rapid course with fever or hemorrhages.

Diagnosis.—The diagnosis can only be made accurately by means of a blood examination. A great excess in leukocytes indicates leukemia as distinguished from leukocytosis. A mild degree of the former is differentiated from a marked leukocytosis by the fact that the increase in leukocytes is chiefly of the polynuclear neutrophiles. Hodgkin's disease is simulated by lymphatic leukemia on account of the enlarged glands, but in the former these are found in large bunches, which is not the case in lymphatic leukemia.

Prognosis.—The prognosis is unfavorable though some few cases

of cures have been reported. As a rule, the course of the disease is progressively fatal, death usually occurring within two or three years. Acute cases are sometimes fatal within a few days. Death may result from hemorrhage, cerebral apoplexy, exhausting diarrhea, or other complications, but usually it is due to a direct exhaustion. Periods of improvement sometimes take place, but these are only temporary. Cases of lymphatic leukemia are more intractable and more rapidly fatal. Cases occurring in children are also more rapid in their course.

Treatment. — Life may often be prolonged by a strict attention to such hygienic measures as have already been detailed under Chlorosis.

Arsenicum (2x) is the remedy most often indicated. It is the main remedy of the old school, who also employ quinine and iron. Upon what process of reasoning they prescribe iron is quite beyond conception. *Phosphorus* (6x) may be indicated, and according to Erb *Picric acid* is capable of producing an artificial leukemia. Grauvogel recommends *Natr. sulph.* and *Thuja* as the chief remedies. The former is more useful in the lymphatic variety and *Thuja* in the myelogenous. *Nuxvom.* and *Sulphur* are frequently indicated. The treatment is purely symptomatic, and any remedy may be of service that is well indicated.

PSEUDO-LEUKEMIA.

Synonyms. — Hodgkin's Disease, Adenia, General Lymphadenoma, Multiple Malignant Lymphoma, Malignant Lympho-sarcoma.

Definition. — An anemic disease associated with hyperplasia of the lymph glands and often a new formation of lymphatic tissue in other glands, spleen and bone marrow, but without the characteristic destructive blood changes of true leukemia.

Pathology. — There are practically two varieties of Hodgkin's disease (1) that which presents simply an enlarged spleen (the less frequent one); and (2) that in which the lymphatic glands are chiefly involved. The changes peculiar to this disease are especially found in the lymphatics and in the spleen. The lymphatic glands become enlarged, through an increase of the lymphoid cells with or without increase of the reticulum. At first the glands are small, isolated, soft, elastic and freely movable. Later they become firm and fusing together form a solid mass which may reach in size the proportions of a child's head, and often surrounded by a fibrous capsule. The size of a single affected gland ranges from that of a filbert to that of a hen's egg. The growth may ultimately penetrate the capsule, and extend into surrounding tissues, and may even perforate a vessel. The

solidification of a group of glands is also brought about by inflammation of the surrounding connective tissue. The pressure of the enlarging glands may cause atrophy of neighboring structures and interfere with the functions of organs. The glands are usually affected in the following order,—cervical, axillary, inguinal, retro-peritoneal, bronchial, mediastinal and mesenteric. Usually both sides, but sometimes only one side, is affected. On section the softer glands present a whitish or reddish-gray color, and the firmer glands a grayish or yellowish-white. The spleen is enlarged in three fourths of the cases, but slightly enlarged in many of these, being rarely so marked as in leukemia. In most cases there are growths about the size of peas, distributed through the organ, or may occur in larger nodules, looking like suet, as Hodgkin noted. Their histological structure is like that of the lymph glands. Lymphomata may also develop in the tonsils, lingual follicles, intestinal lymphatics, liver, kidneys, lungs, brain, heart, testicles, retina and skin. The lymphoid cells of the bone marrow may be increased in number, often to such an extent that the marrow resembles pus in its appearance, being not unlike the changes occurring in the bone marrow in true leukemia. The blood changes are those characteristic of anemia. The red corpuscles are usually, but not always, reduced in number, but the hemoglobin is reduced sixty per cent or more. The leukocytes are not normally increased, but cases occur, occupying a middle ground between Hodgkin's disease and lymphatic leukemia, in which the white cells are increased in number and in which the lesions of a pure lymphatic leukemia may ultimately develop. However, a pseudo-leukemia never approximates true leukemia in its blood changes, the two diseases presenting entirely distinct and separate pathologic states.

Etiology.— Nearly three fourths of the cases occur before the fortieth year of age, and about the same proportion exists as between males and females affected. The true cause of pseudo-leukemia is unknown. In many cases the disease has been preceded by tuberculosis, especially of the lymph glands. “The disease would seem to belong to the group of infectious granulomata, but the infectious agent is not known.” (Anders.)

Symptoms.— Usually the glandular symptoms are those first noticed, the submaxillary and cervical glands enlarging, usually on one side first, both sides soon becoming involved. They grow gradually, but finally may become as large as the fist. In rare cases the external glandular enlargements are entirely absent. At first they give the appearance of tuberculosis or syphilitic disease, but later they become bunched into tumors characteristic of Hodgkin's disease. They then

cause great disfigurement, and also produce pressure symptoms, pressure upon the trachea sometimes necessitating tracheotomy. In the course of a few months, usually, but sometimes years, the axillary, inguinal, and often the internal glands enlarge. Important and varied pressure symptoms then result according to the number, size, and location of the tumors. Enlargement of the bronchial and tracheal glands may cause dysphagia, dyspnea, thoracic pain, disturbed phonation, and venous congestion. Alarming cardiac disturbance may arise from compression of the vagus. The enlargement of the abdominal glands may cause abdominal pain; they may press upon the portal vein (causing ascites and portal obstruction) or upon the common bile duct (causing persistent obstructive jaundice). Bronzing of the skin has been found associated with enlargement of the abdominal glands. The multiplicity and variety of symptoms liable to arise from pressure upon neighboring structures are too numerous to detail. Numbness, tingling, neuralgic pains and paralysis arise in various parts of the body from pressure upon the adjacent nerves. More often, gradually following the enlargement of the lymphatic glands, but sometimes concurrent with, or even in rare cases, preceding, occur the symptoms due to anemia—pallor, weakness, dyspnea, palpitation, etc. With these also appear gastro-intestinal derangement, headache, giddiness, emaciation and edema of the lower extremities. There is quite often fever, very irregular and variable in degree, and cases have been observed in which there was paroxysmal glandular enlargement coinciding with fever, the enlargement subsiding with the decline of the fever, but not reaching the degree present prior to the enlargement. Remarkable ague-like paroxysms may occur, separated by periods of normal temperature. When these paroxysms of fever occur, the case usually runs a more rapid course. Any of the symptoms common to pernicious anemia may be manifest. When new lymphatic growths occur in other structures, they give rise to symptoms consequent upon small tumors similarly located.

Diagnosis. — The diagnosis from true leukemia is easily made by an examination of the blood revealing the absence of leukocytosis. Tubercular glands most closely resemble the enlarged glands of pseudo-leukemia, but they are adherent to each other and adjacent tissues, while the lymphadenoid growths are loose and easily movable, and as a rule are of slower growth, and occur mostly in children and young persons. Tuberculosis rarely involves more than one group of glands, is characterized by caseation and suppuration, while the lymphadenoid growths rarely ever suppurate. In all conditions involving enlarged glands and liable to be mistaken for Hodgkin's disease, the enlargement is limited to single groups, which in itself precludes pseudo-leukemia.

Prognosis.—Except in very rare cases Hodgkin's disease terminates fatally within from a few months to two or three years. The course of the disease and the ultimate prognosis depend largely upon the extent and location of the glandular tumors and the pressure-results to which they may give rise. The more fever that marks the case, the more unfavorable is the prognosis. The course of the disease is frequently marked by more or less prolonged periods of temporary improvement. It is claimed that some cases pass into a true lymphatic leukemia.

Treatment.—The general treatment is the same as that recommended for pernicious anemia. The medicinal treatment is purely symptomatic. Probably about the same remedies will be mostly called for as have been mentioned for true leukemia, Arsenicum (2x) or Arsen. iod. (2x) being the chief remedies. They should be used in the lower triturations.

Therapeutics of Anemia.

Ferrum.—Iron is undoubtedly the foremost remedy in anemia, but it is not the only remedy and should never be prescribed unless the symptoms indicating it are present, when its curative effects are often marvelous, whether it be given in crude form or in the lower or medium attenuations. As a rule, however, the best results are obtained when the drug is administered in appreciable doses. The beneficial effects of iron in anemic states, however, are not due to the fact that it is supplied as a food to the blood which is deficient in this constituent; for, as Hughes truly remarks, "The malady does not ordinarily arise from any failure in the quantity of iron supplied in the food. If the element is deficient in the blood, the fault lies in the assimilative processes. But Reveil has ascertained that in anemia there is no change whatever in the amount of iron present in the blood. However few the corpuscles, they contain within them the full proportion of the metal normal to health; and though under the influence of iron itself they increase to double and triple their number, they yield no more iron." It is also true that when iron is introduced into the system in large quantities, with a view to supplying the deficiency of iron in the blood, that it is not assimilated, but may be almost entirely reobtained from the feces, having been eliminated by the intestines. It is also true that the immediate primary effects of iron are to increase the red blood corpuscles, as before noted, but its continued use results in exactly the opposite condition. It is thus evident that iron does not act as a curative agent by virtue of its absorption as a constituent of the blood, but rather are we led to conclude, from its physiological

effects upon the organs and tissues of the body, that it owes its therapeutic virtues to the same essential dynamic quality possessed by other drugs, and its application is subject to the same therapeutic law. There is always a sort of nervous erethistic condition present if iron is the remedy. It is never indicated in anemia characterized by a torpid, sluggish condition. Though there is great weakness, and the patient can not endure the slightest excitement or fatigue, yet he can not keep quiet, and is better for very gentle exercise. The face is of a pale earthy hue, but flushes very easily; there are frequent attacks of severe headache, the head is inclined to be hot and the extremities cold, and the hands and feet are often edematous. Dewey says, "When the patient has an appearance of full bloodedness or plethora, which is followed by a paleness or earthiness of the face and puffiness of the extremities, then Ferrum will benefit." The patient is very easily excited, is sensitive to cold air, and can not endure pain. Often there is palpitation of the heart, with a well-marked bellows murmur. Iron is an exceptionally valuable remedy in erethistic chlorosis with the above symptoms, and in addition there is usually a milky, acrid leucorrhea, and pale, watery menses, with lumps of blood, and attended with labor-like pains in the abdomen; also gastric symptoms, especially nausea after eating, or about midnight. Sometimes the menses are suppressed, and vicarious discharges of blood occur from other parts, especially the nose or lungs. It is an invaluable remedy in secondary anemia following hemorrhage, especially from the uterus, its characteristic erethistic symptoms being present. In many instances the lower triturations of Ferrum act well, but as a rule it is better to use the drug in crude form in some one of the many reliable preparations which are to be obtained. Blaud's pills are most popular with the old school.

Cinchona.—Secondary anemia following hemorrhages or loss of other vital fluids—nursing, leucorrhea, night sweats, seminal emissions, excessive venery, onanism, etc. It is often a valuable remedy in leukemia and in chlorosis when caused by, or associated with, the conditions named. It acts well in the higher potencies as well as the lower. Goodno says it should be administered in five- to ten-drop doses of the mother tincture. I have never found this necessary, and generally use the second dilution. It is often indicated in anemic disease consequent upon, or associated with, disease of the liver or spleen. The patient presents a pale, sickly, earthy or grayish-yellow color; face sunken, pinched; eyes sunken and surrounded by blue margins; ringing or humming in the ears; loss of appetite; little food seems to fill stomach full, with heaviness; stomach sore; abdomen full and distended

with a wish to belch, which does not relieve; lienteric stools; great debility; excessive sensitiveness, erethism.

Arsenicum.—A valuable remedy in pernicious anemia and other grave anemic diseases. There is great weakness and prostration; the face has a deathly appearance; pale, cachectic look, edema of the face, eyes and lower extremities; general anasarca; liver or spleen enlarged. I have found the best results from the higher potencies, though I frequently employ the third and sixth trituration. Some recommend the second trituration and even Fowler's solution. With the old school arsenic stands next to iron in frequency of use in anemia.

Chininum sulph.—This drug is said to cause both anemia and leukemia with great debility and prostration. The action of quinine in causing an enlarged spleen interferes with the blood-making functions of that organ. It is especially useful in these diseases when malaria is the cause and the liver and spleen are enlarged. The symptoms calling for its use are very nearly the same as those mentioned under Cinchona. It gives best results when used continually in moderate doses. I prefer the first or second trituration.

Acetic Acid.—Anemia of nursing women when the milk is impoverished and the child does not thrive. Anemia with dropsy; the skin looks white and waxy, like alabaster, and when considerable gastric disturbance is present. The dilute acid may be used or the first or second dilution.

Aletris.—Especially useful in chlorosis; atony of the female organs. According to E. M. Hale, "It is the China of the uterine organs." Its most important symptoms are: Tired with dull, heavy, confused feeling in head, and inability to concentrate the mind; power and energy of mind weakened. According to Hering the drug is most useful in "debility, especially of females, from protracted illness or defective nutrition; no organic disease." The drug is generally used in the mother tincture.

Calcareo carb.—Anemia from malnutrition; scrofulous diathesis; face pale and hollow or bloated, with deep-seated eyes, surrounded by blue rings; disposition to colds and diarrhea; great weakness or curvature of the spine; vertigo, especially on going upstairs; disgust for meat; craving for sour and even indigestible things (chalk, coal, etc.); after eating, swelling of the stomach and palpitation of the heart; menses sometimes too often and too profuse, or wanting; leucorrhea; great shortness of breath; great weakness of the muscles; walking wearies and makes the heart palpitate; sitting causes severe backache and headache; therefore constant inclination to lie down; hands and feet are cold; the fingers sometimes appear dead. The sixth trituration

is usually most satisfactory, but I have had excellent results from the thirtieth dilution.

Helonias.—Anemia and chlorosis in women resulting from atony of the sexual organs and general malnutrition. In nearly all conditions calling for Helonias there will be present great fatigue and prostration, with a burning or a tired, dragging, aching feeling in the lumbar and sacral regions. Dose, from two to ten drops of the mother tincture.

Natrum mur.—Long-standing cases, with cachexia; from malnutrition, malaria or loss of fluids, blood or semen; emaciation; herpetic eruptions; palpitation and fluttering of the heart. I almost invariably use the thirtieth potency.

Phosphorus.—Long-standing cases; tuberculous; hemorrhagic diathesis; purpura; enlarged liver; jaundice; ascites; puffiness around the eyes; dry, hacking cough; great weakness in the sexual organs, consequent upon previous irritation of these parts; leucorrhea of a whitish, watery slime, especially profuse during the time of the menses, sometimes acrid and corroding; a total loss of energy in all the organic functions of the body. I prefer the sixth dilution.

Plumbum.—Anemia, mucous membranes very pale, great prostration and lassitude. Inveterate chlorosis, with constipation, tendency to neuralgia; edema of the feet and anasarca. The best results are obtained from the sixth to the thirtieth dilution.

Pulsatilla.—Especially useful in chlorosis, where the well-known temperament of Pulsatilla is present; amenorrhea; menses retarded or irregular, scanty, slimy; characteristic gastric symptoms; dizziness, especially on rising; better in the open air; great weakness or sluggishness in the circulation, manifesting itself in constant chilliness, coldness and paleness of the skin and face, with hot flashes and transitory redness of cheeks; soft, irregular pulse and palpitation of the heart; oppression of the chest and shortness of breath; disinclination to move. I have had best results from the thirtieth and higher potencies, but it is often necessary to give the lower dilutions.

Sulphur.—Chronic cases, when they come to a standstill and do not respond to carefully selected remedies; history of a constitutional dyscrasia; cutaneous eruptions; heat of the head and cold feet; redness of the lips and other orifices; faintness about 11 A. M., etc. The thirtieth and higher dilutions are best. Sometimes the sixth acts well. Consult: Ars. iod. (2x), Calc. iod. (2x), Calc. phos. (6x), Chin. ars. (2x), Carb. veg. (30x), Cycl. (2x), Fer. phos. (6x), Graph. (6x), Ign. (3x to 30x), Ipec. (3x), Iod. (3x), Kali iod. (1x), Merc. sol. (3x), Nux vom. (3x), Phos. acid (1x), Senecio (1x), Sepia (6x to 30x), Silic. (6x), Picric acid (3x), Zinc (6x), Zinc picrate (3x).

II. DISEASES OF THE DUCTLESS GLANDS.

ADDISON'S DISEASE.

Definition. — A disease of the suprarenal capsules, characterized by tubercular infiltration and degeneration of the capsules, a bronzed or pigmented skin, progressive anemia and asthenia.

Pathology. — "Addison emphasized the fact that while the suprarenal bodies were affected with a fibrocaseous alteration in many cases, the anatomical changes were by no means always the same. Both suprarenal capsules are usually diseased at the same time. Tuberculosis is the commonest condition, and is often associated with tuberculous lesions in other parts of the body, as in the lungs, bones and other glands. Rarely, it seems to be primary, no other evidences of tuberculous infiltration being found. The capsules are enlarged, firm in places, and nodulated on the surface, owing to the caseous masses surrounded by fibrous tissue. Sometimes there is marked cicatricial contraction of the adrenals, and the adjacent structures may be found matted together with the capsules. Microscopical examination shows a reticulum of connective tissue surrounding a soft cheesy, granular, and fatty detritus, lymphoid cells, and some giant cells. Other morbid processes in the adrenals that are non-tuberculous in nature have also been found associated with Addison's disease, such as atrophy of one or both glands from interstitial cirrhosis, carcinoma or sarcoma and chronic inflammation.

"Especial attention has recently been given to the condition of the *solar plexus* and *semilunar ganglia* of the abdominal sympathetic, and implication of these nervous structures by compression, cicatricial contraction, or by chronic inflammation, is not infrequently discovered together with a degeneration of the nerve cells.

"Enlargement of the solitary and agminated follicles of the intestine, and slight enlargement and some softening of the spleen are noted at times; parenchymatous or fatty degeneration of the heart, liver and kidneys, has also been noted in some instances. The thymus gland may be found to have remained normal, or even to have enlarged, perhaps. The deposition of pigment is in the same anatomical elements as in the negro in the lower layers of the rete Malpighii." (Anders.)

Much effort has been put forth to explain the relations existing between the peculiar symptomatology of this disease and the anatomical lesions present. The two theories chiefly advanced are: (1) That the disease is due to loss of function of the suprarenal capsules. (2) That

the disease is due to irritation of the abdominal sympathetic plexus, usually owing to disease of the nerves, the ganglia, or the adrenals. In other cases, a functional nerve disturbance must be supposed to exist. There are arguments on both sides, and no satisfactory conclusions have been reached.

Etiology.—The predisposing causes of Addison's disease are unknown. Tuberculosis, scrofula and syphilis have each been assigned as causes. The disease is more frequent in men than in women, and usually occurs in middle life, although no age is exempt.

Symptoms.—The onset of the disease is insidious. Sometimes the pigmentation of the skin is the first symptom observed; more often, however, it does not appear until after the constitutional symptoms have lasted for some time. It usually appears first on exposed parts and when normal pigment is present, as the face, neck, backs of the hands, the axillæ, abdomen, groins, genital regions and the areolæ of the nipples. It also appears on the mucous membranes of the mouth, lips, conjunctiva, and vagina. The color varies from a yellow to an olive-brown, greenish-brown, or even a black. The pigmentation may at first occur in scattered areas, but finally tends to become diffused, so that the patient may resemble a mulatto. The color finally changes to a lusterless bronze. White patches of leukoderma may be seen here and there, in marked contrast to the pigment deposits.

The constitutional symptoms consist of extreme languor, muscular fatigue, asthenia, indigestion, anorexia, nausea and vomiting, dyspnea, cardiac palpitation, headache, vertigo, melancholia, and excessive drowsiness. The heart's action is feeble, the pulse correspondingly small and rapid, and there is also often a tendency to fainting. Gastric irritability and prostration are usually early symptoms, and, as the disease progresses, are associated with an intractable diarrhea. The mind is usually clear, but the patient is peevish, listless and apathetic. Late in the disease, there may be somnolence or a semicomatose state, incoherent, slow speech and sometimes delirium. Ultimately the asthenia becomes so profound that the patient can not rise, but keeps his bed, growing weaker and weaker, till he dies of sheer exhaustion. Sometimes there are convulsions, possibly due to brain anemia. The urine is usually normal, although occasionally there is polyuria, and sometimes the urinary pigments have been found increased.

Diagnosis.—Pigmentation of the skin alone is never sufficient to justify a diagnosis of Addison's disease. A similar discoloration is found in: (1) Carcinomatous and tuberculous disease, particularly when seated in the abdomen and when involving the peritoneum; (2) hepatic disease, such as the cirrhosis of diabetes, protracted jaundice, chronic

congestion and lithemia ("liver spots"); (3) pregnancy and uterine disease, in which the patchy discolorations (chloasmata) appear principally upon the face; (4) irritation of lice and dirt and exposure, as in the case of tramps and vagrants ("vagabond's disease"); (5) tinea versicolor; (6) melanotic syphilitic eruptions; (7) the administration of silver nitrate for a long time (argyria); (8) marked brunette complexions and racial admixtures.

The diagnosis of Addison's disease is hardly justifiable unless there be present the progressive asthenia and gastric irritability.

Prognosis.—Addison's disease has been considered incurable, but a number of apparently genuine cases are reported as having been cured under homœopathic treatment. The average duration of the disease is about one year. Acute cases may terminate within a few months. Cases are on record that have lasted for several years.

Treatment.—A light, easily digested but nourishing diet should be maintained. An absolute milk diet has been advised. Exercise should be careful and moderate, never amounting to overexertion. Rest in bed during more or less of the time is advisable, as in this way an attack of syncope is best avoided.

Extract of the suprarenal glands of animals in the treatment of Addison's disease has received much attention of late. I have little confidence in this method of treatment, as the reports are highly contradictory. It is employed in doses of ten grains in glycerine hypodermatically each day, or five-grain doses of the dried gland, or the glands may be eaten as food either cooked or uncooked.

Arsenicum.—This remedy is most often indicated, and I believe is the most effective agent we have. Its prolonged administration produces a pigmentation of the skin so closely simulating that of Addison's disease that differentiation is often quite difficult, especially when Arsenic has at the same time produced its characteristic gastric irritability and asthenia. In the latter case give Arsen. high—thirtieth or higher—otherwise the low triturations act better.

Argentum nitric.—According to Goodno, "*Argentum nitricum*, in the experience of physicians connected with the Metropolitan Hospital (homœopathic), New York, serves to lessen suffering and prolong life. The cutaneous discoloration of the skin produced by it is of no therapeutic value, because it is a chemical and not a dynamic effect of the drug. Nitrate of silver is made especially valuable in Addison's disease because of its influence over degenerative nerve processes in general; and these are certainly present in this disease. It also produces loss of appetite, chronic wasting, lowering of the bodily temperature and diarrhea." It should be used in the second or third dilution freshly prepared.

Payr recommends also *Bellad.*, *Natr. mur.*, *Iodium*, *Ol. jec. asel.*, *Cinchona*, *Ferrum*, *Phosphor.*, *Cuprum*, *Lycop.*, *Carb. veg.*, *Ars. iod.*

Hughes mentions in addition to *Arsen. Calc. ars.*, *Kreosot.* Raue recommends *Kali carb.*, on account of the paretic effects upon the heart muscle of the potassa salts; *Sepia* and *Sulphur*, especially for the earlier stage. The medicinal treatment is purely symptomatic; and many other remedies may be required in the course of the disease.

TUBERCULOSIS OF THE LYMPH GLANDS.

Synonyms.—Scrofula, Tuberculous Lymphadenitis, Tubercular Adenitis.

Pathology.—The bacillus of tuberculosis is the essential element of scrofula. Experiments on guinea pigs and rabbits have shown that inoculation with scrofulous material invariably produces tuberculosis. "It is not yet definitely settled whether the virus which produces the chronic adenitis or scrofula differs from that which produces tuberculosis in other parts, or whether it is the local conditions in the glands which account for the slow development and milder course." (Osler.)

The pathology of scrofula, therefore, is that of tuberculosis localized in certain groups of glands, and showing a tendency to spontaneous healing. Usually only the glands first infected are involved, the disease apparently being thus limited by the natural powers of resistance in the tissues. Cases do occur, though rarely, wherein the lymph glands throughout the body become infected, with but little or no involvement of other organs. The disease is therefore divisible into two groups: (1) Local tuberculous adenitis, and (2) general tuberculous adenitis. The cervical glands are most frequently affected, appearing in various degrees swollen and tender, in many instances, suppurating. The submaxillary glands are usually the first involved, but those in the posterior cervical triangle are also frequently invaded on one or both sides, though commonly one side more than the other. The cervical and axillary glands may be conjointly involved, forming a continuous chain behind the clavicle and pectoral muscles. The glands may remain isolated and mobile, but they tend to become fused so as to form large knobby tumors. When suppuration occurs, the pus is usually sterile, and it is not known whether the suppuration is excited by the tubercle bacilli and their products, or by a mixed infection of pus organisms. The mesenteric and retro-peritoneal glands (*Tabes mesenterica*) are involved next in frequency to the cervical. These glands do not tend to suppurate, but caseate, and tend to calcify, thus

furnishing a mode of healing. The bronchial glands are frequently the seat of tuberculosis, the tendency here being to caseate, and often liquefy. Tuberculosis of the bronchial glands is often associated with pulmonary tuberculosis.

Etiology.—The etiology of scrofula is that of other tuberculous diseases, the bacillus being regarded as the immediate cause of the specific inflammatory process. The disease is most common in children and young persons, but no age is entirely exempt. Negroes are particularly susceptible to the disease, especially the cervical involvement. A very important predisposing cause is an acute or chronic catarrh of the mucous membranes. Tuberculosis of the cervical glands may be brought about by infection taking place through an inflamed naso-pharyngeal mucous membrane, the natural resistance of the tissue-cells being lowered. Infection may also take place through the tonsils, though the latter are more powerful to resist and overcome the invading bacilli. Infection of the cervical lymph glands may also take place through the medium of skin eruptions (eczema), injuries and abrasions, though it is probable that this method of infection is comparatively rare. *Tabes mesenterica* may occur primarily from direct infection, but more often it is secondary to intestinal tuberculosis. It prevails among poorly fed children in the slums, and in badly drained, and ill-ventilated houses of the poor. Occasionally *Tabes mesenterica* occurs either as a primary disease or as secondary to pulmonary tuberculosis. Bronchial lymphadenitis is usually associated with bronchial catarrh, the infection taking place as in naso-pharyngeal catarrh and attacking the bronchial glands direct.

In general tuberculous adenitis, the infection reaches all the glands through the lymph current. It is most common among negroes.

Symptoms.—With tuberculous cervical adenitis, there are few, if any constitutional symptoms, though occasionally a slight fever may be present, until suppuration occurs, when fever, anemia, and emaciation result. If the glands suppurate, and discharge spontaneously, a chronic sinus remains. The physical signs have already been sufficiently considered. *Tabes mesenterica* gives rise to swelling and pain in the abdomen, due chiefly to the associated peritonitis. Sometimes there is present a peritoneal effusion. Obstinate diarrhea, probably due to tuberculous intestinal ulcers, is the most prominent symptom. The stools are usually thin and offensive. There is always more or less fever of an intermittent type, and anemia and emaciation take place. The child's limbs become puny, wasted and anemic, and the abdomen prominent, from the enlarged glands and the associated tym-

panites. The latter often becomes so pronounced that the enlarged glands can be palpated only with great difficulty. Often tuberculosis of the peritoneum is present when an uneven, tender, nodular enlargement is plainly felt. Death generally takes place through exhaustion, or some acute intercurrent disease, such as enteritis or possibly from an extension of the disease to the lungs or pleuræ. With tuberculous bronchial adenitis, there may be cough, with fever and emaciation, but as a rule, when constitutional symptoms become prominent, they are due to a systemic infection, or to an extension of the disease to the lungs.

In *general tuberculous adenitis* there is swelling, pain and tenderness of all the visible glands, including the cervical, submaxillary and axillary glands. There is a continuous remittent or intermittent type of fever, debility and emaciation. The glands have a marked tendency to suppurate. The course is usually chronic, but occasionally acute, in which case the disease resembles pseudo-leukemia, though there is usually more fever. Death usually results from asthenia or from some intercurrent disease, from pressure upon the respiratory passages or from an acute infection of the pulmonary meninges.

Diagnosis.—Tuberculosis of the lymph glands may be confounded with lymphatic leukemia, Hodgkin's disease, and simple lymphoma. The differences are, however, characteristic, and should be readily recognized by the physical signs and clinical history.

Prognosis.—The prognosis in local tuberculous adenitis is usually favorable, recovery being sometimes spontaneous. If systemic infection takes place and general tuberculous adenitis or pulmonary tuberculosis result, the prognosis is unfavorable. "Scrofula" was once considered a protection against consumption. It is now considered a menace, as Tyson says, "because of the danger of systemic infection through it, and it is said that three fourths of the cases of acute tuberculosis owe their existence to it."

Treatment.—The general treatment of tubercular adenitis is that of general tuberculosis. Plenty of fresh air and sunshine, nourishing and easily digested food, proper clothing and sanitary surroundings, are of the utmost importance. When suppuration has set in, in an exposed gland, it should be opened with a knife to prevent an unhealthy sinus, slow healing and an unsightly cicatrix. On account of the danger of systemic infection it is now the custom to remove cervical tubercular glands by surgical methods.

Too much can not be said in favor of constitutional homœopathic treatment. The remedies most often required are: Calc. iod., Calc. carb., Calc. phos., Ars. iod., Ars., Iod., Merc., Merc. iod., Kali. iod.,

Graph., Lyc., Silic. and Sulph. After suppuration has taken place: Hepar. sulph., Merc. and Silic. These remedies are usually required in the sixth or lower, but in some cases act well in the higher potencies.

GOITER.

Synonyms. — Bronchocele, Tracheocele, Thyrocele, Struma.

Definition. — A chronic enlargement (hypertrophy and hyperplasia) of a part or all of the thyroid gland. The term includes all enlargements of the thyroid gland other than those due to inflammation, malignant disease, exophthalmic goiter or parasites.

Pathology. — All simple goiters start in a true hypertrophy of the gland follicles, but assume ultimately special peculiarities on which are based anatomical varieties, between which there are various combinations or intermediate types. Tyson gives the following subdivisions: (a) *Struma mollis*, or parenchymatous or hypertrophic goiter, in which there is a true hypertrophic enlargement; (b) *Struma ancurysmatica*, in which the vessels are enlarged and dilated; (c) *Struma fibrosa*, in which there is an excessive development of fibroid tissue; (d) *Struma colloides*, in which the follicles are enlarged and filled with colloid matter; (e) *Struma cystica*, when the follicles have enlarged to cysts with liquid contents; (f) *Struma ossea*, characterized by calcareous infiltration, and (g) *Struma amyloidea*, in which there is a wax-like product caused by amyloid change.

Etiology. — Goiter occurs only sporadically in this country. In some countries, especially in the mountainous districts of Europe, Asia, Mexico, and South America, particularly in the Alps, Pyrenees and Andes, it occurs as an endemic, and in Finland it has occurred in epidemic form. It is quite prevalent in New England, about the eastern end of Lake Ontario, and in the State of Michigan, where it seems to be caused by the use of lime-stone drinking waters. No doubt the latter is the chief exciting cause. The disease is more prevalent in women than in men. Pregnancy seems to be a predisposing cause, and young girls at puberty and soon after are quite liable to be affected. No doubt heredity is an important etiological factor.

Symptoms. — In most instances goiter causes no subjective symptoms and is only objectionable on account of the disfigurement. The size varies from a very slight enlargement to one so great that the gland, large and pendulous, overhangs the chest. It may be one-sided or bilateral, or only affect the isthmus, and may be larger on one side (usually the right) than on the other. There is no painfulness and usually no tenderness in the tumor, which rises and falls with each act of deglutition. Even a very large tumor hanging over the chest may cause

little trouble except from its unsightliness and inconvenience. When, however, the growth extends more or less downward and inward it creates pressure symptoms, sometimes of an alarming character. Pressure on the esophagus may interfere with deglutition, but far more serious is the dyspnea sometimes caused by pressure upon the trachea. When located behind the sternum, the tumor may press upon the veins in the neck, causing swelling of the face and head and sometimes headache and drowsiness. Tetany and convulsions are sometimes caused by pressure on the carotids. Pressure on the nerves, especially the pneumogastric, may cause spasm of the glottis, paralysis of the abductor, and even complete paralysis of one or both vocal cords. Pressure upon the pneumogastric has been known to cause sudden death.

Auscultation may reveal a loud blowing murmur, especially marked in the vascular bronchoceles. In cystic goiter, fluctuation may be usually detected.

The size of the tumor is usually increased after each succeeding pregnancy and during and after each menstrual period.

Diagnosis.—The location and distinctive character of goiter renders its diagnosis an easy matter. The fact that the tumor always rises with each act of swallowing is diagnostic.

Prognosis.—Goiter rarely proves fatal, and yet is rarely cured after adult age. Cases occurring in girls evidently depending upon generative disturbance, are usually controllable. Death sometimes results from compression of the trachea, carotids or pneumogastric nerve.

Treatment.—Persons living in a district where goiter is common should drink only boiled water or water imported from soft springs. If the disease threatens life, a change of residence is desirable. *Iodine* (30x) is the homœopathic remedy for goiter. *Spongia* (30x) is also an excellent remedy, probably due to the iodine it contains. The old school also depend largely upon iodine, which they give both internally and by painting the growth externally. They generally employ the iodide of potash internally. An ointment made from the biniodide of mercury is also employed externally. I do not think the local treatment of goiter by these methods has proved of any value. To satisfy the desire of the patient I sometimes permit them to use iodine (1x dil.) externally. In goiter occurring in girls and in recent cases in young adults I have received most decided benefit from galvanism—applying the negative pole over the tumor. Others employ electrolysis, needles attached to the negative pole being inserted into the substance of the tumor while a large sponge or clay positive electrode is placed in the vicinity. In old, large tumors causing dangerous symptoms, surgical methods are sometimes employed. Extirpation is sometimes resorted to, but is

always a dangerous operation. Other methods are injection of iodine, tapping of cysts, incisions and ligature of the thyroid arteries. The use of thyroid extract is at present popular, and has apparently cured some cases.

Consult also Badiaga (2x), Brom. (30x), Calc. carb. (30x), *Calc. iod.* (2x), Ferr. (6x), Fluor. ac. (3x), Kali iod. (1x), Lyc. (30x), *Merc. sol.* (3x), *Merc. iod.* (3x) and Sulph. (30x).

EXOPHTHALMIC GOITER.

Synonyms. — Grave's Disease, Basedow's Disease, Struma Exophthalmica, Tachycardia Strumosa.

Definition. — A disease characterized by protrusion of the eyeballs, enlargement of the thyroid gland, dilatation of the arteries, and palpitation of the heart.

Pathology. — This disease may rightly be classed among the neuroses. There are various theories, as to its nature among the most important of which briefly stated are: (1) that it is due to disturbed innervation (Buschan); (2) that the seat of the disease resides in the medulla oblongata; (3) that it is an affection of the sympathetic nerves; and (4) that it is a disease of the central nervous system associated with a chronic intoxication. Of late years Möbius and others have held to the view that exophthalmic goiter is primarily a disease of the thyroid gland (*hyperthyrea*), in antithesis to myxedema (*athyrea*). One of the arguments adduced to prove the latter view is that the exhibition of thyroid extracts always aggravate the disease, and in those in whom the disease is not present causes similar symptoms; viz., tachycardia, tremor, headache, sweating and prostration. This proves at least the homœopathicity of thyroid extracts in the treatment of the disease, but does not establish the fact that exophthalmic goiter is due to disturbed functions of the thyroid gland. Little is known as to the real pathologic changes.

Etiology. — The disease is more common in women than in men—in the former before and in the latter after thirty years of age. The predisposing causes are unknown, but it would appear that some inherited or acquired peculiarity of the nervous system is necessary to produce it. As to exciting causes, emotional disturbances, such as shock, fright, chagrin, worry, or prolonged mental strain seem to act as important etiological factors.

Symptoms. — As a rule, the onset of the disease is insidious, though the symptoms may develop rapidly, following some great shock to the nervous system. Cardiac symptoms are the first to appear.

Palpitation of the heart is extreme, the pulse rate usually reaching from 120 to 140 and not infrequently 180 to 200 beats per minute, increasing and diminishing with the presence or absence of exertion or excitement. If the latter be unusual the tachycardia is often accompanied by an irregularity of the pulse and dyspnea of a distressing nature. The cardiac impulse is so strong as to be both audible and visible, but the volume of the pulse is small. The carotids and the abdominal aorta pulsate with more or less violence, and there may be capillary pulsation. In long-continued cases there may be hypertrophy of the heart, which may, in debilitated subjects, merge into dilatation. A systolic murmur is often heard at the base, usually soft, but sometimes loud; more rarely at the apex, when it may be due to relative insufficiency of the mitral or tricuspid.

In rare cases tachycardia is the only symptom, the disease progressing no farther; but in most instances exophthalmos or protrusion of the eyeballs, accompanies or soon follows the symptoms of cardiac disturbance. This may be confined to one eye, but usually both are involved. The degree of protrusion varies greatly, from a slight staring expression to a point so great that the eyelids do not cover the sclerotics, leaving a rim of white above and below the cornea, giving the patient a peculiar startled look. The protrusion may be extreme, so that the eye is dislocated from its socket. In extreme cases there is a condition in which, when the eye is cast down or raised, the lid fails to follow it, as it does in health. In some cases the palpebral fissure is increased in width owing to the persistent retraction of the upper lid. Retraction of the lower lid is occasionally seen. The patient winks less frequently than in health. Pulsation of the retinal arteries can be seen with the ophthalmoscope, but other changes in the retinae are rare. The same is true of the pupils. A lack in convergence of the two eyes has been pointed out. The glandular enlargement develops with the exophthalmos. It is rarely so great as in simple goiter, and may be general or involve only one lobe. The growth is elastic, rather soft, and has a thrill similar to an aneurysm. On auscultation, may be heard a systolic murmur, or more commonly a venous hum.

Nervous symptoms are usually present. *Muscular tremors* form an early symptom; they are involuntary, and fine in character, numbering about eight to the second. (Osler.) There is also irritability, restlessness, a disposition to start at the slightest sound, and insomnia. Various symptoms of a hysteric or neurasthenic character are manifest. At times the mental depression deepens into a profound melancholia. There is a tendency to general neuralgic pains. Symptoms of general

paresis have been observed in a few instances. Muscular weakness, either local or general, is pronounced. There is often a localized muscular atrophy, and that peculiar nervous symptom known as *astasia-abasia*, in which there is inability to stand and inability to walk. The patient becomes anemic, and is at last extremely emaciated. The skin is persistently moist with perspiration, and the electrical resistance of the body is diminished. Gastro-intestinal symptoms are common. There may be attacks of diarrhea with vomiting. A dark coloration of the skin sometimes takes place, more decided in those situations in which the pigment is naturally more abundant, such as the face and arms, and also on parts subject to constant pressure. This pigmentation is similar to that present in Addison's disease. There may also be patches of leukoderma. Edematous swellings of the skin in various parts of the body may occur and swelling of the feet and ankles. The nails sometimes become thin, and occasionally have a corrugated appearance. There may be a slight irregular fever. Albuminuria, with polyuria and glycosuria are common complications. Menstrual disorders frequently occur, amenorrhea being the rule, although menorrhagia may occur.

Diagnosis.— After the disease is fully developed there is no possibility of error in diagnosis. In the incipency of the disease or when either the exophthalmos, tachycardia or goiter is absent, as is sometimes the case, there is danger of error. The pulsating character of the growth is sufficient to distinguish it from simple goiter.

Prognosis.— In fully developed cases the prognosis is unfavorable. Taken early the disease can often be controlled and cured, though the course is usually slow and tedious. Death usually results from a dilated heart induced by the circulatory disturbance.

Treatment.— Rest, both mental and physical, is an important therapeutic measure. Absolute rest in bed is desirable and has a wonderfully beneficial effect in some cases, but it can not be enforced in all instances, as some patients can not endure the enforced quiet and idleness. They become very nervous, and dwell to such an extent upon their ailment that it is better to allow them gentle exercise and a continual daily change of surroundings. Sometimes a change of residence to some quiet spot with moderate elevation is beneficial. At all times the patient should be influenced to avoid all worry and excitement, and should be as pleasantly and happily, as well as quietly, situated as circumstances can be made to allow. The diet should be nutritious and digestible. Massage and electricity are highly recommended. The galvanic current should be employed, using a light current (two or three milliamperes) twice or three times a day, about five

or six minutes each time. The positive pole should be placed over the nape of the neck, the center of its lower border corresponding to the seventh cervical spinous process, and be held firmly in that position during the application. The negative pole should then be moved up and down the side of the neck from the mastoid process along the course of the great nerves. Lockwood recommends that the cathode should be placed at the back of the neck or at the angle of the jaw, while the anode is placed over the course of the sympathetic in the neck or over the heart. He says that an application for fifteen minutes every second day is sufficient. The use of cold sponge baths and ice-bags to the spine or precordium are highly recommended to control the tachycardia. I think the ultimate effects of such treatment are harmful.

A few cases of cures are reported as having been made by removing nasal hypertrophies. Feeding with raw thyroid glands of the sheep, and hypodermic injections of thyroid extract, have been employed. Thyroidectomy has been resorted to, but the formidable character of the operation, and the great question as to the etiological influence of the glandular enlargement seems to preclude the operation, except as a last resort, and even then it would probably be better to let the patient die.

The medicinal treatment is purely symptomatic. Any remedy recommended for goiter, for tachycardia, or for cardiac disease in general, may be indicated and prove of benefit. *Lycopus* (Tincture), however, is the one remedy of the homœopathic Materia Medica that has proved most beneficial in exophthalmic goiter. I have seen it produce most wonderful results in relieving the protrusion of the eyeballs and the tumultuous action of the heart. I usually give drop doses of the tincture every hour. *Belladonna* (2x or 3x) is often useful for the throbbing carotids and severe headaches, and is frequently indicated by the totality of the symptoms having been given the credit of several cures. See Treatment of Goiter and Tachycardia.

MYXEDEMA.

Synonyms.—Athyrea, Sporadic Cretinism, Pachydermic Cachexia, Cachexia Strumipriva.

Definition.—A constitutional disease, due to atrophy and loss of function of the thyroid gland, and characterized by a myxedematous infiltration of the subcutaneous tissue and a cretinoid cachexia. The name "myxedema" is derived from the peculiar swelling of the skin, due to the development of a myxomatous new growth.

Varieties.—Osler recognizes three groups of cases: (1) Congenital

myxedema, or sporadic cretinism; (2) true myxedema; (3) operative myxedema or cachexia strumipriva.

Etiology.—Myxedema is dependent on loss of function, due to removal or disease, of the thyroid gland; the ultimate cause of this loss of function in ordinary myxedema is not as yet explained. The disease is much more common in women than in men, and may be hereditary. A neurotic condition sometimes precedes the development of the disease. It sometimes occurs as a transient condition, second only to exophthalmic goiter. According to Osler, pregnancy may cause a disappearance of the myxedematous symptoms.

Symptoms.—(1) *Congenital Myxedema, or Sporadic Cretinism.*—This is the infantile type of the disease, and is a form of idiocy associated with the absence of the thyroid, or with a functionless thyroid. There is almost complete arrest of mental and bodily development. The *cretin* is a dwarf, having a thick neck, short arms and legs, and prominent abdomen. The face is large, the lips are thick, the tongue is large and usually protrudes.

(2) *True myxedema.*—The symptoms of this form were first described by Ord in 1888, as follows: A marked increase in the general bulk of the body; a firm, inelastic swelling of the skin, which does not pit on pressure; dryness and roughness, which tend, with the swelling, to obliterate in the face the lines of expression; imperfect nutrition of the hair; local tumefaction of the skin and subcutaneous tissues, particularly in the supraclavicular region. The physiognomy is altered in a remarkable way; the features are coarse and broad, the lips thick, the nostrils broad and thick, and the mouth is enlarged. Over the cheeks, sometimes the nose, there is a reddish patch. There is a striking slowness of thought and of movement. The memory becomes defective, the patients grow irritable and suspicious, and there may be headache. In some instances, there are delusions and hallucinations, leading to a final condition of dementia. The gait is heavy and slow. The temperature may be below normal. The functions of the heart, lungs and abdominal organs are normal. Hemorrhage sometimes occurs. Albuminuria is sometimes present, more rarely glycosuria. Death is usually due to some intercurrent disease, most frequently tuberculosis. (Greenfield.) The thyroid gland is diminished in size, and may become completely atrophied and converted into a fibrous mass. The subcutaneous fat is abundant, and, in one or two instances, a great increase in the mucin has been found.

(3) *Operative Myxedema, or Cachexia Strumipriva.*—This is a form of myxedema which follows as a result of the surgical removal of the thyroid gland. It occurs in animals as well as man. It is more

likely to follow total than partial removal of the thyroid, but does not follow every case. The disease is rare in this country. The symptoms are practically identical with those of true myxedema.

Diagnosis.—The diagnosis is easy. A mistake can not well be made, if the peculiar characteristics of the disease are borne in mind.

Prognosis.—The prognosis has been regarded as decidedly unfavorable, though of late years, since the use of the thyroid extracts, these views have been somewhat modified. Tyson says: "At the present day, the effects of the administration of thyroid preparations in myxedema are among the marvelous results of medicine. The duration of the practice has, however, been scarcely sufficient to admit of unqualified conclusions as to it." As a rule, the course of the disease is slow and progressive, frequently lasting from four to fifteen years. Death often occurs from some intercurrent disease.

Treatment.—Owing to the usual subnormal temperature in myxedemic patients, it is necessary that they should be warmly clothed, wearing flannel next the skin all the year, and that their apartments should always be kept warm and equable. The diet should be largely nonnitrogenous, and composed of easily digested articles of food. Any special symptoms arising should receive the indicated homœopathic remedy, but thyroid feeding is the only form of treatment that has proved anything more than palliative. The following details of the thyroid treatment are quoted from Anders:—

"Since the brilliant results obtained by Murray, however, the internal use of the thyroid gland of sheep or calves has come into a well-deserved favor in the treatment of all cases of myxedema, whether of the so-called true form, of sporadic cretinism, or of the cachexia strumipriva. The gland may be given raw or cooked, in the form of the glycerin extract, or in the dry and powdered extract; the last named is sometimes put into tabloid form. If cooked, the gland should be only partially 'done.' The fresh thyroid is minced and often spread on bread, and from one quarter to half a gland may be taken daily."

The glycerin extract is readily made. "Several dozens of thyroids of young sheep or calves are carefully separated from the connective tissue, cut into small pieces about the size of a bean, and then put into a jar and covered with glycerin of the best quality, allowing 2 c. cm. of glycerin for each lobe of the thyroid used. The mixture is permitted to stand for twenty-four or thirty-six hours, and is then squeezed through a cloth, so as to get out as much liquid as possible. This 2 c. cm., corresponding to about half a gland, may be given at a dose. If used for hypodermic injection, to a drachm (4.0) of the glycerin extract is added half a drachm (2.0) of a 1-per-cent solution of carbolic acid in

distilled water, of which mixture from 10 to 15 minims (0.66-1.0) may be injected three or four times a week." (Osler.)

"It is safest — for reasons that will be pointed out below — to begin with quite small doses, and gradually increase, especially if there is much gastric irritation. Not more than 5 minims (0.333) of the glycerin extract should be given at the start. This dose may be increased gradually until 15 or 20 minims (1.0-1.33) are taken three times daily. From 3 to 5 grains (0.194-0.324) of the powdered gland or tabloid form will be a safe commencing dose in adult myxedema; a caution, however, is necessary regarding the various manufactured preparations of the thyroid gland, some of which are impure and even dangerous, owing to the careless handling or fraudulent substitution in order to meet the demand for thyroid extracts on trial in other affections (as obesity and psoriasis)."

"The toleration of thyroid feeding does not depend upon the volume, but upon the functional activity of the gland, and this fact, together with the evidences of toxic action reported in some instances of the administration of thyroids to a maximum degree, make it important to urge again — as intimated above — the necessity of small dosage at the beginning of treatment, the most careful and judicious increase in the quantity given, and the closest observation of symptoms indicative of hyperthyroidization. The additional fact of an occasional cumulative action should also be emphasized. Should vomiting, renal pain, tachycardia, suffusion of the face, syncope, vertigo, or marked headache supervene, the remedy should be stopped at once. Epileptiform convulsions have also occurred. The treatment may be resumed again cautiously, alternating with intervals of cessation. Good results are obtained usually within a month, though it is probable that even after all the symptoms have subsided the treatment may have to be continued off and on if the thyroid gland seems to be permanently atrophied."

SECTION VI.

CONSTITUTIONAL DISEASES.

ACUTE ARTICULAR RHEUMATISM.

Synonyms.—Rheumatic Fever, Inflammatory Rheumatism.

Definition.—An acute febrile disease, constitutional but probably not infectious in character, though its exact nature is not understood. It is characterized by fever, inflammation in and around the joints, occurring in succession, and a great tendency to inflammation of either the endocardium or pericardium.

Pathology.—The joints are chiefly affected. The lesion is a simple serous synovitis. Similar lesions may involve the sheaths of adjacent tendons. Usually the synovial membranes are injected and swollen, and their surfaces may be coated with fibrin. The synovial fluid is increased and is thinner, of a reddish color, containing some gelatinous coagula of fibrin, and under the microscope nucleated cells, ordinary pus cells being rarely seen. The surrounding connective tissue is swollen and edematous. The fibrin of the blood is usually increased.

Etiology.—The chief exciting cause of acute articular rheumatism is exposure to cold. This may be from exposure to a sudden change of temperature, or prolonged exposure to a moderately cold, damp condition of the atmosphere. Undoubtedly the disease often occurs, especially in an epidemic form, quite independently of any such exposure. The chief predisposing cause is a lowered vitality. This is often the result of insufficient food, great fatigue, or long-continued overwork. Heredity may be traced in about one fourth of the cases. The disease is most common during the winter and spring and in the temperate zones, both the extreme north and the extreme south being mostly exempt. No age is exempt, but the disease occurs most often in young adults, and is rare before ten or after forty years of age. One attack predisposes to another and relapses are common. Several theories have been advanced as to the real cause of rheumatism, but none of them have been satisfactorily proved. These are: (1) The *nervous theory*—that the rheumatism is due to disturbances by cold of the nerve centers presiding over the nutrition of the joints. (2) The

metabolic or lactic acid theory—that the rheumatism is due to a morbid material produced within the system in defective processes of assimilation, this material being either lactic acid or certain combinations with lactic acid. (3) The *uric acid theory* of Haig, that uric acid formed in the blood may be deposited in the joints by diminished alkalinity of the blood. (4) The *germ theory*—that rheumatism is due to a specific microbe. "In favor of this view may be mentioned the close analogy which exists between rheumatism and certain of the infectious diseases. The analogy is marked with gonorrhea, scarlet fever and septic processes, which are frequently associated with arthritis and endocarditis. The investigations hitherto made have not, however, shown the constancy of any micro-organism in the disease." The fact of the occasional occurrence of epidemics of rheumatism is argued by some as favoring the theory of microbic origin.

Symptoms.—As a rule, the patient experiences for a day or two before the attack uncomfortable feelings and a general sense of aching and languor. Following this there may occur rather abruptly a chill or chilly sensations and fever, followed by the joint symptoms. More often shooting pains and stiffness in the joints, malaise and moderate fever are the first symptoms noticed. Except in very acute cases and those in which the meninges of the brain are involved, the fever is rarely intense, seldom reaching 103° F. and running no typical course. The pulse is seldom above from 90 to 100 and is usually full and often dicrotic. Irregular exacerbations of fever usually mean a fresh invasion of other joints or some complication, such as endocarditis or pericarditis. A fall in temperature usually indicates a subsidence of the disease. In rare cases there is intense hyperpyrexia, when the temperature rises rapidly from 104° to 110° F., and even higher. With this are associated cerebral symptoms of an alarming and dangerous nature. Violent headache and delirium to which may be added unconsciousness, pulselessness, and cyanosis, rapidly ending in death, unless promptly relieved. This combination of severe symptoms is known as the meningeal form, or rheumatism of the brain. Cerebral symptoms sometimes result from the too prevalent method of overdosing with salicylic acid or its salts. There is great thirst, profuse acid sweats, scanty, high-colored, acid urine, at times showing traces of albumin and the bowels are constipated. The involvement of the joints is nearly always multiple, generally including the medium-sized or larger joints, especially of the lower extremities. The knee, ankle and wrist are oftenest implicated, and next in frequency are the shoulder, elbow, and hip joints, lastly the fingers, toes and intervertebral articulations. As it is rare to have one joint only affected, so it is even more rare to

have all the joints involved. There is always a tendency of the disease to shift from one joint to another and back again, it being impossible to predict from day to day where the involvement will be greatest on the succeeding day, and in which joint most relief will be experienced. The inflammation, however intense, may quickly subside in one joint, while at the same time an acute disturbance appears in another. Corresponding joints are often affected together, and when not, the different affected joints are either on one side of the body, or those on both sides which are analogous. The involved joints are tender, hot, red and swollen, often edematous, and exhibit the local signs of a rapidly developed inflammation. Pain, aggravated by motion and pressure, is an important and prominent symptom. It is usually intense and often made agonizing by the least attempt to move the joint. To diminish the tension which aggravates the pain, the patient is disposed to lie with all the limbs semiflexed. The joint symptoms are usually less marked in children, sometimes the tendons being alone affected, the joints themselves escaping. The profuse sweatings are distinctive and require passing notice. They are very copious and are usually acid in reaction, sometimes even to such an extent as to impart an acid odor to the air of the room. Sudamina are of frequent occurrence the result of irritation at the orifices of the sweat glands, from the excessive perspiration. Erythema urticaria, and even purpura may appear. Subcutaneous nodules attached to the tendons fasciæ are frequently present. They vary from the size of a shot to that of a pea, and are rather firm, somewhat movable, and usually painless. They occur on the fingers, hands and wrists, the elbows, knees, scapula, and spines of the vertebræ. They may be numerous or few and last for a few days or months; they may disappear, and after a brief interval reappear. They are more common in children than in adults.

In no other disease does the blood become so rapidly anemic. Leukocytosis is always well marked.

A disposition to recurrence is characteristic of acute rheumatism. Quite rarely does a person who has had one attack escape another. This is especially the case in young persons. The intervals between attacks may be from a few months to many years, largely according to the exposure of the patient.

The course of the disease may vary from a few days to several weeks. Frequently the most violent and painful cases terminate more rapidly than those presenting milder symptoms. An acute attack may be followed by any of the forms of subacute or chronic rheumatism. Subacute rheumatism represents a milder form of rheumatism. The constitutional and local symptoms are less pronounced, but the duration

of the disease is longer than in the acute form, and the condition tends to become chronic. "It should not be forgotten that in children this mild or subacute form may be associated with endocarditis or pericarditis." (Osler.)

Complications.—The complications of acute rheumatism are usually of a serious nature. The most important and of most frequent occurrence are cardiac diseases. These are (1) Endocarditis, (2) Pericarditis, and (3) Myocarditis. Both the pericardium and the endocardium may become involved in mild as well as in severe cases. The approach of cardiac complications is often insidious, making it important and necessary to examine the heart daily during the course of an acute rheumatism. In some instances, especially in the abarticular rheumatism of children, the heart may become diseased without any involvement of the joints. Children are most liable to cardiac complications, the liability diminishing with increasing age. There are no constant symptoms indicative of cardiac complication. There may be a slight elevation in temperature, with some palpitation, precordial pains, and dyspnea, but these are not always present. According to Strümpell there may also be attacks of angina pectoris of apparently purely nervous origin. On the other hand, cardiac oppression and palpitation may occur without actual structural change, and even a functional murmur may occur in acute rheumatism, and this, too, not only at the base, but also at the apex of the heart, an unusual site for a functional murmur. (Tyson.)

1. *Endocarditis.*—This is the most common form of complication. It appears in from twenty-five to thirty per cent of all cases, both mild and severe. The inflammation is confined almost exclusively to the left heart. The mitral leaflets are much more frequently attacked than the aortic. Endocarditis rarely endangers life but in most instances it is the beginning of chronic valvular lesions. Malignant endocarditis occurs in a very small proportion of cases.

2. *Pericarditis.*—Pericarditis is a less frequent complication. It may occur alone or in connection with an endocarditis. The inflammation may be plastic, sero-fibrinous, or, in children, purulent. The immediate danger to life is greater than in endocarditis, but it rarely proves fatal, and its secondary consequences are much less serious. In children a rheumatic pericarditis may run a very obscure course, without developing the characteristic physical signs of the disease. These are fully described in the article on Pericarditis.

3. *Myocarditis.*—This complication is, fortunately, very rare. It is almost always secondary to endo- or pericarditis. Often its presence is not suspected until the characteristic changes are discovered post-mortem.

The next most important and frequent complications are those of lungs and pleuræ. *Rheumatic pneumonia* is of rare occurrence. It is usually associated with pericarditis, the left lung alone being involved. Resolution usually takes place rapidly. Often the characteristic cough and rust-colored sputum is entirely absent.

Congestion of the lungs occurs occasionally, and sometimes proves fatal. *Pleurisy*, fibrinous, rarely sero-fibrinous, frequently occurs. The left side only is involved, and usually results from an extension of a pericarditis.

Hyperpyrexia and cerebral rheumatism have already been mentioned under Symptoms. According to Duckworth, cerebral rheumatism assumes one of three clinical types:—

(a) There is delirium, mild and wandering, or so violent as to call for restraint, followed by semicoma, coma and death.

(b) The patient passes suddenly into coma, which terminates fatally, at times within a few hours.

(c) There are well-marked spasmodic symptoms, followed by fatal coma. Chorea, chronic nephritis, pharyngitis and tonsillitis may occur as complications.

Diagnosis.— Usually the diagnosis of acute articular rheumatism is easy, but similar symptoms may arise from pyemia, and from scarlatinal or gonorrheal rheumatism. The last form will be considered later, as will also pyemia. Scarlatinal arthritis is of rare occurrence, and the history of the case is usually sufficient to determine its nature. Traumatic synovitis and tuberculosis of the knee joint frequently simulate the monarticular variety.

Prognosis.— Recovery generally takes place, but the course is liable to be slow, with irregular fluctuations, and leaving a disposition to subsequent attacks. The heart is frequently left in a crippled state, and ultimately fatal valvular lesions become manifest. Subacute and chronic rheumatism not infrequently follow. The constitutional condition and habits of the patient have great influence upon the course of the disease, though it must be admitted that serious cases often occur in those of apparently robust health and exemplary habits.

Treatment.— The patient should be placed in bed between blankets, and clothed in light flannel garments. Care must be taken to avoid direct draughts of air. The diet should be liquid. Nitrogenous foods must not be allowed. Milk is the best diet. This can be supplemented by farinaceous foods if necessary. Meat juice, broths or soups may be given if milk can not be borne. Lemonade, with very little or no sugar, can and should be used freely. It, as well as the milk, can be mixed with carbonated waters if desired. Buttermilk

may be allowed freely. As soon as convalescence is well under way, a fuller and more nutritious diet, including white animal meat, chicken, etc., may be permitted. Stimulants should be severely avoided, unless they be demanded by great prostration, feeble heart, etc. The affected joints should be enveloped in absorbent cotton. It is often advisable to render the joints immobile by means of padded splints. The cotton and splints should be changed occasionally, and the skin carefully bathed with hot water and soap. W. H. Dickinson recommends the following lotion for local use: one part *tincture Aconite*, three parts *Chloroform*, and four parts *Alcohol*. Gatchell recommends for local use Potas. carb., 1 oz.; Opium tinct., 6 oz.; warm water 1 pint, applied on flannel compresses and covered with dry cotton. The skin of the entire surface of the body should be kept cleansed and in a healthy condition. A urinal and bedpan should be used, the patient neither being required to attempt leaving his bed, nor to lie in filth. The bowels should be kept open by the daily use, if necessary, of enemas or glycerin suppositories. The heart should be carefully watched. During convalescence the patient should keep his bed for several days after the temperature has become normal, and not leave the house for several days later. This rule may be modified in hot, dry weather. If the weather be cold and damp, the patient must remain in the house and in a warm room.

Therapeutics. — In the medicinal treatment of acute rheumatism, the remedy must be selected solely on the totality of the symptoms. During the course of the disease many various remedies may possibly be demanded, but I shall only give the indications for those most frequently required.

Aconite. — Seen at the onset there are few cases in which Aconite is not indicated, nor do these indications always cease as promptly after the initial stage as in other inflammatory diseases. This is due to the fresh invasions continually taking place and each giving rise in turn to fresh constitutional disturbances. For this reason Aconite may be required not only at the onset of the disease, but also from time to time more or less continuously during the early stages of its course, even though other remedies are at the same time demanded. It is also frequently indicated when cardiac complications first appear. No doubt many cases occur in which the characteristic features of Aconite are absent and its use contraindicated. It is oftenest required in cases occurring in children and young people. As in other inflammatory affections, if given during the chilly stage, it may induce a critical sweat, and if it does not abort the attack, greatly modify its violence. Later it is called for by the high fever, great thirst, restlessness and anxiety.

The affected parts are red, swollen and extremely sensitive, and the pains shooting or tearing in character. The low dilutions are preferable. I generally employ the second.

Bryonia. — In cases not seen at the very onset, or those where Aconite has already somewhat modified the attack, or failed to do so, and the disease is following a typical course. Also in typical cases, when the disease is not ushered in by constitutional disturbances, Bryonia is the remedy by far the most frequently indicated. The local inflammation is intense, part swollen, hot, shining redness, painful, pain much increased by the slightest motion, relieved by warmth, great thirst, rapid pulse, face flushed and hot, tongue covered with a dirty white fur, loss of appetite, urine scanty and dark, with reddish sediment. It is especially useful when pericardic, pleuritic, or pneumonic complications are present. Goodno thinks it acts better when there is much periarticular edema. The second dilution is preferable.

Rhus toxicodendron. — This is one of our most frequently indicated and most efficacious remedies in rheumatism. It may be indicated at any time, but more often after Bryonia. It is not often indicated in the acute stage, but later and in subacute forms. It is particularly useful in recurrent cases brought about each time by causes below mentioned. Also in cases where fever is not high or assumes an adynamic type, with great restlessness, increased pains on lying in one position, and constant desire for change of position, with temporary relief on changing; red shining swellings of the joints; pulse rather weak and rapid. A very important indication for Rhus is that the attack is caused by and aggravated by cold, wet weather and northeasterly winds; by getting wet, especially when overheated; by working in the water; by living in damp houses and from checked perspiration. The second or third dilution is most successful.

Colchicum. — This drug is best suited to the subacute form, but is sometimes useful in the acute form, especially if the disease is confined to the smaller joints of the hands and feet, shifting from one joint to another; great sensitiveness to touch; worse from motion; tearing pains, always worse at night; edema of the parts, especially hands or feet; especially small joints; very irritable and easily annoyed by external impressions, such as light, noise and strong odors; gastric symptoms. Cardiac complications, especially pericarditis. I generally use the second dilution. Sometimes the first is preferable.

Colchicine is sometimes employed. Goodno says: "Some eight years ago I began the use of *colchicine* for typical acute articular rheumatism, with the result of discovering that it is as nearly a specific

for articular rheumatism as quinine is for malarial intermittent fever. A sufficiently large number of cases have now been treated by me and a number of colleagues to thoroughly demonstrate its value. A solution of the strength of one grain of Merck's colchicine to one ounce of alcohol is a very satisfactory strength for dispensing purposes. Like many other medicines, colchicine gives the most satisfactory result when given almost to the point of producing its physiological action, the indication of which is the development of some disturbance of the gastro-intestinal tract (nausea, colic, loose movements). It is desirable to avoid this result, which is easily done if the remedy be discontinued upon the appearance in the slightest degree of symptoms of this character, and resumed in one half to two thirds of the previous dose after complete disappearance of the annoying symptoms. If skillfully employed, the pain and swelling quickly diminish, and the most active cases are usually controlled within a few days. A little experience with this remedy is necessary before one learns to administer it to the greatest advantage. It is necessary to continue the general care of the patient, and the medicine for at least ten days, or symptoms may return. This statement applies equally to any method of treatment. Of the preparation of colchicine suggested doses of three to five drops, repeated every two to four hours, is the method I employ.

"The use of these remedies in association with proper general care proves sufficiently satisfactory to enable us to dispense with the use of *morphia*, phenacetin and other drugs for the control of pain, although in refractory cases we may sometimes be glad to avail ourselves of their aid for a short time. The action of colchicine, in particular, is so prompt and effective as often to suggest that an opiate has been given, were one unacquainted with the remedy employed." I have made the above quotation in full, though Dr. Goodno's experience does not correspond with my own, neither is it in accordance with the principles of homœopathy.

Ferrum phos. — As in other inflammatory diseases so in acute rheumatism this drug may prove of great value in the early stage when there is fever without the characteristics calling for Aconite. There is a soft, full, quick pulse; thirst; sweat, which does not relieve the pains. Goodno says: "It possesses much greater control over the fully developed lesion. I am impressed that it has considerable influence over the endocarditis, especially in young subjects, and I have observed admirable results in some cases of a rather subacute character if the parts were exceedingly sensitive to touch and continually painful 'as if mashed.'" The third trituration is usually employed.

Pulsatilla. — The swelling may be considerable, its color is rather pale, and the pains are tearing, jerking, boring, and frequently accompanied by twitchings in the affected member. The most valuable indications for the remedy are the marked prominence of the erratic behavior of the joint symptoms, and the chilliness often recurring with increase of the pains, yet with desire for cool, fresh air. Aggravation in the evening and on moving the affected part after it has been for some time at rest. I prefer the third and higher dilutions.

Kalmia (2x). — Inflammatory rheumatism, shifting from joint to joint, with tendency to attack the heart; high fever; excruciating pains; worse from motion.

Salicylic acid and *salicylate of sodium* are extensively employed by the old school, as well as by many homœopathists who have little regard for the purity of their practice. The Salicylate of Sodium is now most extensively used. It is more soluble, less injurious, and gives better results than the acid. Raue gives the following indications: Inflammatory rheumatism of the joints with great swelling and redness, high fever and excessive sensitiveness to the least jar; motion impossible. There is no doubt but that this drug is very efficacious in at least temporarily controlling the pain and reducing the inflammation. It is claimed that the improvement thus gained "is held, and the patient makes a rapid recovery."

Consult also the therapeutics of other forms of rheumatism.

CHRONIC ARTICULAR RHEUMATISM.

Definition. — A chronic inflammatory swelling of the articular structures, occurring either primarily or following acute rheumatism.

Pathology. — The internal joint changes are more marked than in the acute variety. The capsule and tendons are thickened, also the sheaths of the tendons, thus giving rise to enlargement and impaired motion of the joint. There may be deformities from the contraction of fibrous bands formed about the diseased joints, and in advanced cases ankylosis of the joint may occur. The synovial membranes are injected, though there is but little effusion. The cartilages are sometimes involved and even eroded in some cases. Muscular atrophy supervenes in long-standing cases, sometimes producing deformity. This is most marked in rheumatism of the shoulder joint, when the deltoid and other muscles are involved. There are no cardiac complications as in the acute form.

Etiology. — Chronic rheumatism is a disease of middle life being most prevalent between the ages of forty and sixty. It occurs chiefly in those whose occupation entails exposure to wet and cold or sudden

changes in the weather. It therefore occurs mostly among poor people. Strange to say, there are as yet no claims that chronic rheumatism is of microbic origin.

Symptoms. — The chief symptoms are stiffness and pain in the joints, including their muscular and fibrous coverings, usually worse at night and aggravated by the presence, or even the approach, of cold, damp weather and often by other unknown meteorological influences. The pain is characteristically increased on motion, while the stiffness is often diminished by exercise. The affected joints are tender to the touch, usually somewhat swollen and slightly reddened. Synovial crackling may be appreciated on movement and ankylosis, with some degree (usually slight) of distortion of the joints, may occur. As a rule, those joints are most likely to be involved that are especially exposed to fatigue in the patient's usual occupation. The course of the disease is afebrile, and the general health does not directly suffer from the disease. Valvular lesions may become associated with chronic rheumatism, but are not a direct result as in the acute variety.

Prognosis. — Very few cases are ever radically cured, except by a change of residence to a warm, equable climate, though in some instances a permanent improvement takes place from a change of occupation or from more systematic and careful habits of life especially as regards exposure and clothing. As a rule, however, the patient grows gradually worse with advancing age, though life is not necessarily shortened.

Treatment. — Patients suffering with chronic rheumatism should wear flannel underwear of varying weights the year round, and should avoid exposure to wet and cold and all weather vicissitudes. Residence in a warm climate during the winter and spring is desirable. Moderate exercise should be persevered in as long as the condition of the joints renders it possible. The diet should be nutritious and easily digested. Starchy and saccharine foods should be used sparingly. Hot alkaline waters are particularly useful. Turkish baths, and thermal spring baths are often beneficial. Dry hot air or dry heat is often of great value. Massage, with passive motion, and electricity are valuable adjuvants, and especially when muscular atrophy exists. During an attack great relief is often obtained by applying cold cloths to the joint, covering the same with flannel and oiled silk.

Therapeutics. — Most of the remedies already mentioned for acute rheumatism may be indicated in the chronic form, but the list of possibly useful remedies is much greater. As the rule, the higher dilutions are better in the treatment of chronic rheumatism, though the sixth and even lower may be required.

Rhus tox. is probably the remedy oftenest indicated and most often useful. The characteristic peculiarities of the disease—worse when first beginning to move but better from continued motion, and worse from cold, wet weather, find their exact counterpart in the pathogenesis of *Rhus*. *Bryonia* is often required, the indications being the same as in the acute variety. It is useful in both the articular and muscular forms of the disease. The same may be said of *Pulsatilla* and *Colchicum*. Other remedies are:—

Calcarea carb.—Swelling of the joints, worse with every change of the weather; after working in water, after *Rhus* fails or has only partially cured; gouty nodosities; also general symptoms of the drug.

Arnica.—Sharp pain and bruised soreness in the muscles and joints. Use third to thirtieth dilution.

Dulcamara.—Rheumatism incident upon living in damp rooms or from cooling the body when heated, in cold damp places, cellars, ice houses, etc. Use the third to the thirtieth dilution.

Ledum.—A valuable remedy in rheumatic and arthritic affections. The smaller joints are most affected. Generally worse from the heat of the bed; usually a great deal of bruised soreness in the muscles, with stitching, tearing pains, rapidly shifting; pains go from below upward; rarely useful if joints are hot and swollen. This drug usually gives best results when given low. I have often employed the tincture with better results than were obtained from the dilutions.

Lycopodium.—Elderly lithemic persons with flatulent dyspepsia. Tearing and aching pains in the extremities, especially at night and during rest. Sixth to the thirtieth dilution or trituration.

Manganum.—Shifting from one joint to another, with shivering redness and swelling of the joints; burning spots about joints; pain worse from touch and motion, and at night, causing the patient to moan and groan constantly. I have never employed this remedy below the thirtieth dilution.

Merc. sol.—Especially useful in syphilitic subjects (*Kali iod.*), but may be called for in any case. Tearing pain, not relieved by sweat, which is often very profuse and of a musty smell; worse at night, and in the warmth of the bed; worse also in cold and damp air, also general constitutional symptoms of the drug. In syphilitic cases the third trituration is best. In other cases the drug may be used higher with better success.

Phytolacca.—Heavy aching pains, generally worse in damp weather and at night. Pains particularly below elbows and knees; stiffness and lameness of the muscles. The periosteum may be involved, especially in cases of hereditary syphilitic taint. The tincture is the best preparation to use.

Kalmia (3x). — Wandering pains; especially useful in rheumatism of the chest; rheumatism or gout shifting to the heart; tearing pains in limbs without swelling or fever; pains mostly in upper parts of arms and lower parts of legs; muscles of neck sore; back lame; worse when going to sleep; great weakness.

Rhododendron. — Chronic rheumatism of small joints. Pains in various parts, aggravated before a storm, or in cold, damp, rough weather. Nightly periosteal pains. The lower dilutions are best but the thirtieth and higher potencies have been used with success.

Many other remedies may be required for the special symptoms liable to arise in the course of the disease.

MUSCULAR RHEUMATISM.

Synonyms. — Myalgia, Rheumatic Myositis.

Definition. — A painful affection of the voluntary muscles and their aponeurotic coverings of a rheumatic character. Simple muscles or groups of muscles are involved, the affection receiving various names according to the location of the affected muscles, as torticollis, lumbago, pleurodynia, etc.

Pathology and Etiology. — The pathology of muscular rheumatism is unknown, nor is its nature understood. The disease may be a mild form of inflammation of the muscles, or may be entirely neuralgic in its character. It often accompanies or follows articular rheumatism, and is more frequent in those of a rheumatic diathesis. It occurs oftenest in the male sex. The acute form is most frequent in children and young people, and the chronic form in those of advanced years. There is a tendency to recurrence, one attack rendering the patient susceptible to future attacks. The chief exciting causes are exposure to cold and damp and strong draughts of air, especially when perspiring or after overexertion.

Symptoms. — The onset is usually sudden, requiring but a few hours or less for the disease to develop. The only constant symptom is pain in the affected muscle, which is dull and aching or sharp and cramp-like in character, and is greatly aggravated by motion. Sometimes the muscle is sensitive to touch, but is often relieved by pressure. It is generally worse at night, and the chronic form is aggravated by changes of the weather. Contraction of the affected muscle is common. There is never any marked constitutional disturbance, the pulse rarely going above 90 and the temperature above 100, both often remaining normal. The chronic forms of muscular rheumatism are often very intractable and of indefinite duration. Special names are given to muscular rheumatism, according to the location of the difficulty.

Lumbago, which is the most common form, affects the muscles of the small of the back and their tendinous attachments. The onset is usually very sudden, the patient being taken without warning with a "kink in the back," following a stoop or twist of the body. The condition has all the appearances of a "cramp" of the muscles as occurs in other localities. The slightest attempt to straighten the body or make any motion is accompanied by most excruciating pain, and is often entirely impossible. The attack may pass away in a few hours or last for several days. Recurrences are frequent.

Torticollis, "wryneck," or stiff neck, usually affects the sternocleido-mastoid muscle of one side, but both muscles may be affected, and the muscles of the back of the neck are often involved; the patient is compelled to hold his head to one side as the situation of least discomfort, and when he turns his head, he is obliged to turn the whole body. *Pleurodynia* involves the intercostal muscles of one side, and occasionally the pectorals, the latissimus dorsi, and the serratus magnus. It usually affects but one side, and more often the left. Respiration or coughing are exquisitely painful, and sneezing causes agony. This condition is often mistaken for pleurisy. *Cephalodynia* involves the head muscles of the scalp and facia; *Omodynia*, the muscles of the shoulder and upper arm; *Dorsodynia*, the muscles of the upper part of the back; *Abdominal rheumatism*, the muscles of the abdomen; *Rheumatic myositis* of the extremities.

Diagnosis. — The diagnosis in pronounced cases is usually plain, but the affection may be confounded with neuritis and neuralgia. In neuritis the pain is more localized, and occurs mostly along the course of large nerves. It is often very difficult to distinguish between pleurodynia and intercostal neuralgia. From pleurisy, pleurodynia can be distinguished by the absence of fever and the physical signs of the latter. Dermato-myositis has erythema and hyperesthesia of the skin, there is fever, prostration, enlargement of the spleen, and other symptoms indicating serious constitutional involvement.

Treatment. — Rest of the affected muscle and hot applications are the chief points of general treatment. Often a turkish bath at the outset followed by massage and rubbing with alcohol will abort an attack.

Massage and electricity are often of great value. Static electricity, when available, often gives marvelous results. Strapping the side will give relief in pleurodynia. In lumbago heat gives best results by placing two or three folds of flannel over the affected part and ironing with a hot iron. A hot bath is sometimes beneficial. Osler considers acupuncture "the most efficient treatment" for acute lumbago.

"Needles of from three to four inches in length (ordinary bonnet-needles, sterilized, will do) are thrust into the lumbar muscles at the seat of the pain, and withdrawn after five or ten minutes. In many instances the relief is immediate."

Therapeutics. — *Bryonia* is the chief remedy, it being indicated and useful in a majority of cases. It acts best when given as low as the 2x dilution. Next in efficiency comes *Gelsemium* (1x). *Cimicifuga* (1x) is often of great value. *Aconite* may be required if there is some fever with great restlessness. *Ranunculus* (2x) is the chief remedy in pleurodynia, where *Bryonia* is seldom useful. *Rhus tox.* (2x) is often indicated, but is not so prominently useful as in articular rheumatism. *Belladonna* (2x) is frequently indicated and does excellent service. T. F. Allen says *Berberis* is one of our most efficient remedies in lumbago when the pains extend from the back around the body and down the legs, with red and mucous sediment in the urine. I never employ remedies higher than the second dilution in this disease. Consult also *Asclepias*, *Dulc.*, *Phos.*, *Rhod.* and *Ruta*.

ARTHRITIS DEFORMANS.

Synonyms. — Rheumatoid Arthritis, Rheumatic Gout.

Definition. — A chronic disease of the joints, supposed to be distinct from gout and rheumatism, characterized by progressive changes in the joint structures and by osseous periarticular formations causing great deformity. •

Pathology. — "At an early period there are seen only the changes of inflammation — hyperemia of the synovial membrane and an increased amount of fluid in the joint. After absorption of fluid has occurred, the capsule of the joint is found to be thickened, and the ligaments are elongated, thus permitting ready dislocation. The cartilages are absorbed, and the bones rubbing together are polished and hard, like ivory, a condition which is called 'eburnation.' The articular extremities become thickened and broader, and are flattened out, their margins projecting, and studded with irregularly rounded bony outgrowths. The fluid contents of the affected joints consist of a much altered synovial fluid, especially rich in mucin, and containing cholesterin and lecithin. (Hoppe-Seyler.) In occasional cases the capsule of the joint is partly or wholly ossified. Not only the joints, but the adjacent tendons and their sheaths and the bursæ, become ossified, and the muscles waste and undergo fatty degeneration." (Bartholow.)

Etiology. — This disease is of most frequent occurrence in women, especially sterile women and those who have had uterine or ovarian dis-

ease. It occurs mostly between twenty and thirty years of age, though it may occur as early as twelve and as late as fifty. Heredity seems to be an etiological factor, and nervous shocks, worry and grief are exciting causes. Based largely upon the last-named causative influences is the theory of the neurotrophic origin of the disease. In addition also in support of that theory, which is pretty generally accepted, is the extreme symmetry of the lesions, and the atrophic changes occurring in the nails, the skin, and the muscles. The lesions in many respects resemble the arthropathies of locomotor ataxia.

Symptoms.—The symptoms may be divided into two clinical types: (1) Multiple arthritis deformans, including (*a*) Heberden's nodes, and (*b*) the progressive form, in which successive large joints are invaded in an acute or chronic manner.

(2) The monarticular form, in which one or two joints are alone attacked.

1. Multiple Arthritis Deformans.

(*a*) *Heberden's Nodes.*—These are little hard knobs, or nodules, that develop gradually at sides of the distal phalanges. They may occur in subjects that have had indigestion or gout, but Heberden says, "They have no connection with gout, being found in persons who never had it." The joints are at first swollen, tender and painful, and later are easily made so by accidentally striking them, by cold, or by errors in diet. The phalangeal joints are somewhat enlarged, and may yield a bony grating on passive motion. The large joints are rarely invaded, and the disease, although incurable, does not endanger life, but is not, as was once supposed, conducive to longevity.

(*b*) *The Progressive Form.*—This may be acute or chronic. The *acute* form resembles at first an attack of articular rheumatism—swelling of the joints, tenderness and fever. Many joints are involved. It is most frequent in young women who have recently borne children. "These patients suffer in their general health, become weak, pale, depressed in spirits, and lose flesh. In several cases of this form, marked intervals of improvement have occurred; the local disease has ceased to progress, and tolerable comfort has been experienced, perhaps, until pregnancy, delivery, or lactation again determines a fresh outbreak of the disease."

The *chronic* form is of much more frequent occurrence. The changes in the joints are the same as in the acute form, but they develop gradually and symmetrically, corresponding joints are simultaneously involved, and the lesions progress in them with identical rapidity. The small peripheral joints are usually the first involved, and the lesions

tend to advance steadily toward the trunk, the order of attack and frequency being the hands, knees, feet, ankles, wrists, elbows, shoulders, jaws, cervical spine, hips and dorsal spine. The most striking changes are seen in the knees, which become enlarged and so set that the legs are constantly flexed on the thighs, and the thighs on the trunk. The pain is variable, coming and going, occurring in paroxysms of a neuralgic nature, steady and gnawing, and sometimes is entirely absent. In the early stages, there may be more or less tingling, numbness of the hands and feet, and local sweating and skin pigmentations.

The characteristic feature of the disease is the deformity. The joints gradually become enlarged and altered in appearance. The enlargement is due to thickening of the capsule, to bony outgrowths, and in some cases to synovial distention. The altered shape is due to distortion caused by the osteophytes, to thickening of the capsular ligaments, and to muscular atrophy and retraction. The fingers are generally pointed toward the ulna, rarely toward the radius, and are usually flexed and extended upon the hand, and sometimes overlie one another. More or less luxation of the joints occurs, and finally they may be either entirely or partially immovable. Most patients finally reach a stage where they cease to suffer, and are only inconvenienced by their deformities. There is no tendency to cardiac or other complications.

2. The Monarticular Form.

This form affects chiefly old men, and often follows an injury. The hip, the knee, the shoulder and the spinal column are the parts usually affected. When the hip joint is affected, it constitutes the *morbis coxæ senilis*. Pain, limitation of motion, bony grating and shortening are observed. Atrophy of the gluteal muscles is a conspicuous symptom. The pathological and clinical features of monarticular arthritis deformans are essentially the same as have already been described in the multiple variety. A variety known as *spondylitis deformans*, in which the vertebræ alone are involved, is comparatively rare. It may be associated with the hip joint affection, or involve the cervical spine alone. In such cases, more or less complete immobility of the diseased section of the vertebral column is present.

Diagnosis. — Arthritis deformans can hardly be confounded with other diseases, especially rheumatism or gout. It might be mistaken for a local arthritis of the shoulder joint, an entirely distinct and curable disease "characterized by pain, thickening of the capsule, and of the ligaments, wasting of the shoulder-girdle muscles, and sometimes by neuritis." (Osler.)

Prognosis.—The prognosis as to a cure is unfavorable, though treatment may cause marked improvement and in some cases entirely arrest the progress of the disease. Life is usually not shortened by the disease, but death may result from intercurrent complicating affections.

Treatment.—Everything possible should be done to improve the nutrition and build up the general health—a generous diet, systematic bathing, moderate systematic exercise, fresh air, regular sleep, etc. A change of residence to a mild, dry climate is often of great benefit. “It is surprising how much can be done by carefully applied friction to reduce the thickening, to promote absorption, and to restore mobility.” (Osler.)

Hydrotherapy and massage are sometimes beneficial, the latter especially when there is much muscular atrophy. Much benefit is claimed for the treatment received at the various hot springs, and other springs of this country and Europe. I agree with an intelligent observer with a large experience when he says: “Careful attention to diet, outdoor exercise, freedom from anxiety, and good digestion are much more serviceable than any springs in the world.” Systematic warm bathing at home persevered in would probably do as much good as bathing at the springs; but the element of change of climate and scenery would not be obtained. Strümpell advises the employment of hot-sand baths, which can be used at home; the result is, as a rule, especially favorable when the extremities alone are involved. Steaming the affected parts, hot air, Turkish baths, electricity, and other methods of treatment are recommended, but they probably at best only give temporary relief to the pain. Swedish movements help to preserve and sometimes increase mobility. During painful exacerbations the joint may be wrapped in absorbent cotton and covered with oiled silk.

Arsenic is the remedy chiefly employed by the old school. It is often the homœopathic remedy as well. *Colchicine* is recommended by Goodno as “a most effective remedy when the inflammatory changes have first appeared in the terminal finger joints, attended by swelling, slight sticking pains and sometimes redness.” He uses a “dilution prepared by adding one grain of Merck’s colchicine to one ounce of alcohol; give three drops every two to six hours. The medicine should be carefully watched in order to avoid the production of any annoying symptoms. *Benzoic acid* is useful when the characteristic high-colored, strong smelling urine is present. It is probable that this acid alone or when combined with a base, especially *Lithium*—*Lithium benzoicum*—is as frequently indicated and useful as any other

drug. The benzoate of lithium I generally use in tablets of the 1x trituration.

Also consult *Ars. iod.* (2x), *Aurum mur.* (30x), *Calc. carb.* (30x), *Calc. phos.* (6x), *Calc. sulph.* (3x), *Causticum* (3x), *Graphites* (6x), *Ferum iod.* (3x), *Iodine* (3x), *Ledum* (1x), *Lycop.* (6x), *Manganum* (3x), *Natrum sulph.* (3x), *Natrum phos.* (3x), *Phosphorus* (3x), *Rhododendron* (2x), *Sepia* (30x), *Sulphur* (30x) and *Thuja* (1x).

GOUT.

Synonyms. — *Podagra* (gout in the foot), *Chiragra* (the hand). *Gonagra* (the knee).

Definition. — A disease of nutrition, accompanied by the presence of uric acid in the blood, and the deposit of the urate of sodium in the structure of the joint, and characterized clinically by the sudden occurrence of a paroxysm of severe pain and swelling in one or more of the small joints.

Pathology. — There are many irreconcilable views as to the nature of gout, but as Osler says, "The nature of gout is unknown. That there is faulty metabolism, associated in some very special way with the chemistry of uric acid, we know, but nothing more. The remainder is theory, awaiting refutation or confirmation." Whether gout is the result of an increased formation, or diminished excretion of uric acid, has not been established. However, it has been proved that the blood shows an excess of uric acid. This condition, however, also occurs in leukemia, and is not therefore distinctive. The important anatomical changes are found in the articulations. There is a deposit of the urate of sodium from the blood into the structure of joints and tissues that are not very vascular; first, the cartilages of the movable joints, then the ligaments, tendons, bursæ, and finally the connective tissue and skin, this being the order of feebleness in vascularity and nutritive activity. This deposit is associated with signs of inflammation; to wit, hyperemia, redness of the surface, with swelling and effusion in and around the affected joint. The surfaces of the joint are incrustated with chalk-like masses, consisting of urates, which become greater with each attack, and, finally, cause great deformity. In extreme cases the joints become fixed, and sometimes the skin covering the deposits ulcerates and exposes the chalk-stones. The deposit usually begins in the metatarso-phalangeal joint of the great toe, which sometimes shows the typical changes of gout when other evidences of the disease are entirely absent. Later, other joints become affected, the tarsus and carpus and the surfaces of the metatarsal and metacarpal bones, and some of

the phalanges, are chiefly diseased. The deposits are also sometimes found in the knuckles, eyelids, and cartilages of the ear.

Of the changes found in internal organs those of the kidneys are most important. These constitute the condition known as "gouty kidney." Crystals of urate of soda are deposited in the tubules and intertubular tissues, and may be seen by the naked eye as white lines. The kidneys are small, granular and fibrous. This may be either the ordinary "contracted kidney" or an atheromatous form. In the vascular system the changes of arterio-sclerosis are almost invariably present, and there is cardiac hypertrophy, particularly of the left ventricle. Atheroma and calcareous deposits upon the aortic valves are not infrequent. Emphysema with chronic bronchitis is usually present in the chronic forms of gout, and chronic gastro-enteritis, or chronic colitis is frequent in long-standing cases.

Etiology.—The chief predisposing cause is heredity, but the disease may also be acquired. It occurs in men oftener than women, and rarely develops before the fortieth year of age.

As to exciting causes *Alcohol*, especially in the form of malt liquors and wines, is considered the most important etiological factor. *Food*, especially the large consumption of animal and rich foods by those who take little exercise, is also a very important factor, and these two elements combined—alcohol and food—may be considered the prime causative factors in most cases of gout. Wealth and consequent luxurious habits are not to be overlooked as causes, but they are by no means essential. The inherited tendency being present, the causes named will produce gout, and often the tendency is so great that these are not required. "In England the combination of poor food, defective hygiene, and an excessive consumption of malt liquors makes the 'poor man's gout' a common affection." (Osler.)

The following highly interesting and practical views on the condition of life favorable to gout, are given by G. W. Balfour. After speaking of the increasing disposition to "venosity" of the blood as years advance, with consequent diminished oxidation, he says: "Add to [this, that in a state of civilization man is always supplied with a superfluity of foods and drinks, which the habits of society and the anxiety of his friends tempt him, if they do not actually compel him, to partake of four or even five times a day.

"Moreover, as the bubbling energy of youth fails, the mere pleasure of it no longer incites us to violent exertions; the needs of civilization do not require such exertions from us, and the many luxurious appliances of civilized life aid and abet the natural indolence that grows upon man as age advances, and largely preclude the need for any but the most trifling bodily exertion.

"Hence this less highly oxygenated blood is flooded with a redundancy of nutritive material far in excess of the requirements of the frame, which can neither be used up in any of its ordinary appropriations, nor fully oxidated in any other way, and so excreted. The general metabolism is thus impaired, every function of the body impeded, every secretion deteriorated; all the organs suffer.

"Thus we have the gouty diathesis fully developed; a diathesis — habit of body — present in each one of us after middle life, and which modifies the organic metabolism of each one of us, both in health and in disease.' The gouty diathesis is only a comprehensive term for all those changes in the character and composition of the blood induced by the evils of civilization — deficient exercise and excess of nutriment. . . . Gout, on the other hand, is the name given to all those modifications of our metabolism caused by the gouty diathesis, as well as to all the symptoms to which those modifications give rise."

Lead poisoning is considered as an occasional cause of gout, though such cases are rarely, if ever, seen in this country. Acute attacks of gout are influenced by climatic changes. They are always more frequent in winter, and are often avoided by a timely removal to a warm climate. The disease is rare in America, and comparatively frequent in England.

Symptoms. — Clinically we may recognize three forms of gout: (1) Acute, (2) Chronic, (3) Irregular.

1. *Acute Gout.* — In a typical case of acute gout there are usually premonitory symptoms for several days preceding the attack. These consist of twinges of pain, cramps in the calves, irritability of temper, restless sleep, and dyspepsia. A preliminary asthmatic attack may also occur. The urine is usually overacid and concentrated, and deposits urates. There may be a temporary albuminuria or glycosuria. The quantity of uric acid eliminated before and during the early period of the attack is regularly diminished. The attack itself usually begins suddenly, between midnight and 2 A. M., with an acute pain in the ball of the great toe, which becomes red, hot, swollen, and so sensitive that the slightest touch can not be borne. The discoloration of the toe is peculiar, it having an angry, swollen, dark red, or mottled appearance which once seen is not forgotten. The veins of the foot become turgid. There is occasionally an initial chill. The bodily temperature usually rises to 102° to 103° F. The temperature of the affected part remains several degrees lower. The paroxysm abates toward morning, the pain and temperature diminishing; some swelling, edema, and sensitiveness remain the following day. Usually the attack is repeated the following night, and so on with gradually dimin-

ishing violence for five or six nights, when the attack terminates, leaving the patient in apparently better health than before. The swelling subsides, the skin of the toe desquamates and resumes its normal color. The intervals between the attacks vary greatly. Ordinarily the first interval is the longest, frequently being a year or more in length, but subsequent intervals become shorter, until attacks are liable to occur at any time. At each subsequent attack other joints are liable to be invaded.

The term *retrocedent* or *suppressed gout* is applied to cases where the disease suddenly disappears from its original site followed by sudden and severe symptoms, indicating derangements of internal organs. The following varieties are described by Lockwood:—

a. Cardiac gout consists of sudden pain in the heart, syncope and heart failure, which may be fatal. If the patient recover, dyspnea and palpitation appear.

b. Cerebral Gout.—There may be mental confusion, delirium, or mania. Apoplectiform seizures with coma may occur. Temporary insanity has been observed. In some of these cases, however, the cerebral symptoms have been uremic.

c. Gastro-intestinal Gout.—Pain in the stomach, nausea, and vomiting are not infrequent. Profuse diarrhea may occur, with death in collapse.

d. Vesical gout is characterized by frequent painful micturition and hematuria.

e. Testicular gout is accompanied by painful swelling of the testes.

2. Chronic Gout.—As has already been mentioned, the intervals between the attacks of acute gout gradually become shorter. At the same time the attacks themselves grow milder and longer, the local manifestations each time disappear less completely, and more and more joints become affected. Gradually there accumulate the characteristic morbid changes that have already been described under pathology. The patient usually has dyspepsia, looks sallow, gives evidences of arterio-sclerosis and renal lesions. The pulse has a high tension, the left ventricle is hypertrophied, the urine is increased, higher hued, of a low specific gravity, contains albumin, and a few hyaline and granular casts, and there may be symptoms of uremia. Emphysema, bronchitis and chronic intestinal catarrh complicate the course of the disease in almost all cases.

3. Irregular Gout.—According to Sir Dyce Duckworth, "Gout manifesting itself anywhere but in a joint, is to be considered irregular or incomplete. Irregular gout is said to occur only in persons who have been gouty or have a decided hereditary tendency thereto—a gouty

diathesis. In such persons there is scarcely any superficial or visceral symptom which may not be of gouty origin. This being the case, it is clearly impossible to describe the diversified symptoms and conditions that may arise as a direct result of a gouty diathesis. Among these may be named: (1) *Cutaneous eruptions*—dry, scaly eczema, pruritus ani, hot, itching feet at night, etc. (2) *Gastro-intestinal disorders*—coated tongue, foul breath, constipation, flatulence, “biliousness,” and torpid liver. (3) *Urinary disorders*.—The urine is usually overacid and deposits urates, uric acid and lime oxalate. Temporary glycosuria and albuminuria are not uncommon, especially in patients of advanced years. The symptoms of chronic diffuse nephritis without exudation may appear. Renal calculi are not uncommon, and are usually of the uric-acid variety. Urethritis may develop without gonorrheal infection. (4) *Cerebral symptoms*—mental hebetude, loss of memory, irritability of temper, headaches of such severity as to suggest organic disease, vertigo and sleeplessness. Serious manifestations, such as apoplexy or meningitis may develop. (5) *Cardio-vascular symptoms*—high tension pulse; hot and cold flashes; sudden sweatings; symptoms of cardiac and renal changes. (6) *Pulmonary symptoms*—chronic bronchitis, emphysema and asthmatic attacks. (7) *Locomotor organs*—shooting pains, stiffness and subtendinal bursitis. Cramps in the calves of the legs, burning feelings in the feet at night, tenderness in the heels on standing; gouty neuralgia, especially sciatica. (8) *Joint and muscle pains*—“flying” pains here and there, in the muscles of the back of the neck, the lumbar region, the abductors of the thigh, and the gastrocnemii, etc. These pains are most severe in the early morning hours, and subside as the day advances. Articular pains attended with some degree of swelling and deformity of the joints. (9) *Eye affections*—iritis, glaucoma, hemorrhagic retinitis, and suppurative panophthalmitis.

Diagnosis.—With the history of the case, the character of the symptoms, and the presence of the characteristic deposits, an error in diagnosis seems impossible. However, it is sometimes very difficult to distinguish between chronic gout and arthritis deformans. The following table from Anders gives the main points of difference:—

Gout.	Arthritis Deformans.
Frequently hereditary.	Not so.
Causes are chiefly dietetic.	Causes chiefly nervous.
Affects males and the better classes most frequently.	Affects females and lower classes most frequently.
Begins in the big toe and extends to other toes.	Begins in the fingers, which point to the ulnar side.

Attacks are periodic.	More steadily progressive.
Deformity due to tophaceous deposits.	Deformity due to exostosis and ankylosis, and more marked.
Uric acid usually in excess.	Not so.
Renal complications and arterio-sclerosis common.	Very rare.

Prognosis.—Acute gout is rarely fatal, but is prone to return, much depending upon the mode of life. Chronic gout shortens life, by reason of the nephritis and the arterial sclerosis which so frequently complicate the disease. "Gout influences unfavorably the prognosis from acute diseases or injuries." Persons known to have a gouty diathesis may, by proper living and systematic treatment, successfully ward off, to a great extent, the gouty attacks and their ultimate consequences.

Treatment.—Prophylactic measures are of great importance. Those predisposed to gout should lead temperate lives. They should abstemiously avoid alcoholic beverages, especially malt liquors and wines, and eat sparingly of heavy animal foods, avoiding tea and coffee, and all rich foods, gravies, pastries, spices, condiments, etc. Daily, systematic, vigorous exercise will prevent defective oxidation and aid in the excretion of uric acid, but neither great physical nor mental strain should be allowed. Systematic walking is particularly beneficial. Outdoor life is desirable. Morning cold baths, followed by friction, should be taken regularly. If the patient is weak and anemic, he may use warm baths in the evening before retiring, followed by friction. Exposure to changes and draughts of air should be avoided. Flannel underwear should be worn the entire year. Residence in a warm climate in winter is recommended.

Dietetics.—The observance of the above rules is equally important to one in whom gout has already developed. Dietetic rules must, however, be more rigidly obeyed. As far as possible, all nitrogenized and albuminous foods should be eliminated, more particularly heavy meats, eggs and cheese. Poultry and many kinds of fish are but little less abundant in proteids than are the animal foods. Of course, it is not expected that any patient will or can absolutely avoid the above articles, but they at least should be eaten sparingly. The typical permissible foods are milk, butter, fruits (avoid acid fruits), and the succulent vegetables, except beans and oatmeal. To these, oysters, lobsters, and fresh-water fish may be added moderately. Above all foods, butcher's meats, so-called, are strictly forbidden. Tomatoes and strawberries are particularly injurious. The carbohydrates—starches and sugars—and the hydrocarbons—fats and oils—are allowed, except when they

produce indigestion with fermentation. Farinaceous and saccharine foods are therefore not specially contraindicated. Sir William Roberts says: "The most trustworthy experiments indicate that fat, starch and sugar have not the least direct influence on the production of uric acid; but as the free consumption of these articles naturally operates to restrict the intake of nitrogenous food, their use has indirectly the effect of diminishing the average production of uric acid." Pure water and the alkaline mineral waters should be used freely for their diluent and solvent effects. Natural lithia waters are highly praised. All waters should be drunk when the stomach is empty. Cider is a desirable drink. If alcoholic liquors are required, the distilled liquors, whisky or brandy, should be used. During an attack, the patient should be kept in bed. The affected joints may be wrapped in flannel or absorbent cotton. Often warm applications afford relief. The diet should consist chiefly of milk and farinaceous foods. If there is debility, strong broths may be allowed.

Therapeutics. — With the old school *Colchicum* or *Colchicine* is considered the sovereign remedy. Goodno does not differ from this opinion. He says: "If there is no contraindication, *colchicum* should be administered, as there is no known remedy which possesses a tithe of its influence over the arthritic manifestations of gout. It is antagonized by some homœopathists on account of the material doses which are required, and perhaps for the reason that it is so generally administered and abused by the old school. The use of too large doses of this drug and the endeavor to subdue all cases by its use are responsible for some waning of its popularity. If ten-drop doses of a good tincture, repeated every two hours, do not afford relief, it is wise to discontinue the medicine. One- to three-drop doses often prove successful. Occasionally in typical cases of great-toe gout with a heavily coated tongue, nausea, possibly vomiting, colic or diarrhea, *colchicum* in the first decimal dilution gives prompt results. Cases with marked gastro-intestinal disorder do not often tolerate the larger doses well. My personal experience is much greater with *colchicine*, which I usually give in the third decimal trituration, repeating one-grain doses every one-half to two hours, as required. The smallness of the dose and its pleasant character as compared with that of the tincture of *colchicum* strongly commend it. Its favorable action is also fully equal to that of *colchicum*." *Piperazin* has been warmly advocated in all forms of gout for its supposed effect as a solvent of uric acid, and clinicians are almost unanimous in reporting its favorable results. It probably acts as a diuretic. The dose is five grains three times a day.

There is no drug, so far as I know, that actually produces gout or

a gouty diathesis, but many of them produce symptoms of a similar character and when indicated by these symptoms may prove of great benefit, and, as a rule, should be employed in the thirtieth or higher potencies. The following may be consulted: Abrot., Ant. c., Arg. met., Arn., Ars., Benz. ac., Berb., Bry., Calc. c., Caust., Cinch., Coccul., Colch., Coloc., Gnaph., Guar., Kali iod., Led., Lith., Lyc., Mang., Merc., Nux v., Ox. ac., Phytol., Plumb., Puls., Ranunc., Rhod., Rhus tox., Sab., Sars., Staph., Sep., Sulph.

LITHEMIA.

Synonyms. — Lithic-acid Diathesis, Uric-acid Diathesis, Uric Acidemia, Uricemia, American Gout.

Definition. — The term "lithemia" is applied to a not-well-understood condition (Osler calls it a "hypothetical condition"), probably due to the faulty oxidation of nitrogenous matter, and characterized chemically by an excess of uric acid in the blood, and clinically by various digestive, circulatory, genito-urinary, and nervous phenomena. It differs from gout chiefly in the absence of joint deposits and joint inflammation.

Pathology and Etiology. — Murchison first used the term "lithemia" to designate symptoms due to functional disturbance of the liver and accompanied by an increased elimination of uric acid or urates. But as Osler says, "In the present imperfect state of knowledge it is impossible with any clearness to define the pathology of the so-called uric-acid diathesis." The diathesis bears a close relationship to gout, so that it has been termed "American gout," and no doubt it is due to the same class of causes as gout, but it differs from that disease in being for the most part a latent condition. So long as the uric acid is eliminated properly no symptoms arise, but when from any cause elimination does not take place, the presence of the uric acid in the system gives rise to symptoms practically the same as those which have already been described under Irregular Gout.

Symptoms. — Indigestion with the various gastro-intestinal symptoms usually accompanying such a disturbance is an almost constant symptom. The patient is constipated and the liver inactive. There is great nervous irritability, depression of spirits, hypochondriasis, headache and vertigo. The pulse is usually slow, its tension increased, the aortic second sound accentuated, and there are paroxysms of palpitation of the heart. Tingling, numbness, anesthesia, neuralgic pains and other nervous symptoms are common. The urine is scanty, high-colored, of high specific gravity, depositing, on standing, a heavy sediment

composed of mixed urates or uric acid or both. This condition of the urine is not essential to lithemia, and in some cases is entirely absent.

Diagnosis. — It is next to impossible to positively establish the presence of lithemia as the cause of existing symptoms, the latter being often referred to "biliousness" so-called. Lithemia is hypothetical — a condition inferred rather than actually demonstrated. (Tyson.)

Prognosis. — The prognosis is favorable in most cases where the disease is early recognized and properly treated.

Treatment. — Accepting the statement of Osler that "overeating and overdrinking, when combined with deficient muscular exercise, lie at the basis of this nutritional disturbance," the nature of the general treatment to be adopted is plainly evident. Indeed I do not see as anything different can be recommended from that which has already been mentioned in the treatment of gout, unless it be to emphasize more fully the value of the natural lithia waters, and the use of the salts of lithium, which are certainly in a general way homœopathic to the condition.

DIABETES MELLITUS.

Definition. — A nutritional disease characterized by copious secretion of urine, loaded with sugar, and by a progressive loss of flesh and strength. The term "glycosuria" should be applied only to those cases in which sugar appears occasionally in the urine in small amounts without constitutional symptoms.

Pathology and Etiology. — The nature of diabetes is as yet not fully understood farther than that it is due to some sort of derangement of the glycogenic and glyco-destructive function of the organism. To explain the disease there have been many theories advanced, none of which have as yet been definitely established. Nervous lesions, diseases of the pancreas and the liver, insufficient alkalescence of the blood plasma, and deficient oxidation processes are the chief theories that have received attention.

The pancreas shows morbid changes in more than half the cases. It may be firm and atrophied, may be the seat of pigmentary cirrhosis, or may be the seat of cancer, of cysts or of fat-necrosis. The liver is often enlarged, and may be fatty or show cirrhotic change. The kidneys are often fatty and chronic nephritis is common. The lungs frequently show the lesions of broncho-pneumonia or of lobar pneumonia. The changes peculiar to phthisis are often found in very chronic cases. In the nervous system, according to Osler, there may be tumors or cysts involving the "diabetic center" in the medulla or involving the cerebrum. Anemia, edema, or atrophy of the cortical convolutions may be

found, or congestion and thickening of the meninges. Perivascular changes in the brain and the cord may occur. There may be found a tumor pressing on the vagus. Peripheral neuritis is not uncommon. The sympathetic ganglia may be enlarged. The heart may be fatty or enlarged. Hypertrophy is not uncommon and arterio-sclerosis has been observed. The blood contains an excess of urea, fat and sugar. The fat particles may be visible in coagulated blood; the sugar may be raised from the normal 0.15 per cent to 0.40 per cent; glycogen may be found within the leukocytes. The corpuscles show no special alterations. There is no immediate connection between the percentage of sugar in the blood and in the urine in diabetes.

From the above-named theories as to the nature of diabetes, and from the morbid changes found, it is presumed the disease may be due to different causes, as follows: (1) *Diabetes* due to *pancreatic disease*. (2) Cases occasioned by *hepatic disease (organic and functional)*. (3) Those comparatively rare instances caused by *disease of the brain (tumors, sclerosis, or irritative lesions of the diabetic center) and spinal cord*. (4) Diabetes follows *traumatism*, and especially injuries to the head. (Anders.)

Diabetes is more common in Europe than in this country, and is said to occur oftener in agricultural districts than in cities. The Hebrew race are especially susceptible. It occurs oftenest in the higher classes, but the poor are not exempt. It is a disease of adult life, but children are by no means exempt. I have seen several typical cases in young children. Men are more liable to the disease than women. It occurs oftenest in persons of a literary occupation, when mental fatigue and sedentary habits seem to be the causative factors. It may follow a nervous shock, prolonged mental anxiety and depressing emotions. It sometimes succeeds certain chronic diseases, such as syphilis, gout and malaria, and, in rare instances, has followed acute infectious diseases. It may be induced by long-continued indulgence in saccharine food, especially in those of sedentary habits.

Symptoms.—The onset of the disease is insidious. The first symptoms noticed are thirst and frequent urination, soon followed by loss of flesh and strength. In very rare cases, there is a more acute and rapid onset, especially in children. Often, in the early stages, there is dryness of the fauces, and a glutinous, viscid saliva is secreted. Later, the tongue is usually dry and glazed, the gums swell and bleed, and aphthous stomatitis may occur. The skin becomes dry and harsh, and often there is an intolerable itching; in some cases, drenching sweats may occur, the perspiration being charged with sugar and lactic acid. The temperature remains normal, or later becomes subnormal. There

is a voracious appetite, in spite of which the patient grows progressively weaker and loses flesh. Emaciation is most marked in young subjects, in whom the disease seems to run a more malignant course. Constipation is usually present. If the disease is not promptly controlled, the above symptoms become intensified, the urinary changes are pronounced, and a variety of complicating symptoms may become manifest.

The Urine.—The amount of urine is enormously increased, the quantity passed varying from two to fifteen quarts, from four to six quarts being the quantity in average cases. In rare instances, polyuria is not observed. The color of the urine is pale, and its specific gravity ranges from 1020 to 1050, rarely being as low as 1015; it has an acid reaction, a sweetish, aromatic odor, and a distinctly sweetish taste. The percentage of sugar varies, up to from 1 to 2 per cent in mild cases, and to from 5 to 10 per cent in the severer forms. The total daily excretion of sugar varies, up to from ten to twenty ounces, but it may exceed one to two pounds in the twenty-four hours. The tests for sugar in the urine will be found under Glycosuria. Urea and phosphates are passed in excess, and acetone may be detected. When the phosphates are greatly increased, the condition has been termed *phosphatic diabetes*. There may be a transient albuminuria observed, but it is not of grave significance.

Cutaneous Symptoms.—In the female pruritus vulvæ, and in the male balanitis, result from the irritation and decomposition of the urine on the parts. Boils and carbuncles are of common occurrence, the latter only coming on late in the disease, and being frequently the immediate cause of death. Suppurative processes in general and gangrene are not uncommon. The latter usually occurs in the feet.

Pulmonary Complications.—Lobar and lobular pneumonia and gangrene of the lungs are common and usually fatal complications. Pulmonary tuberculosis is said to be the most frequent pulmonary complication. It usually runs a rapid but often insidious course.

Cardio-vascular Symptoms.—Evidences of arterio-sclerosis are present, especially in gouty cases. Cardiac hypertrophy is common, and dilatation may follow.

Nervous Symptoms.—Diabetic coma often comes on in advanced cases, and usually terminates in death. Convulsions do not occur, but the eyes are half open, the pupils dilated and the eyeballs wandering. In some instances, it comes on suddenly in unsuspected cases, following severe bodily or mental exertion. The patient becomes weak and faint, somnolent, gradually passing into coma, from which he may die within a few hours. In another class of cases, the coma is preceded by weak-

ness and some gastric disturbances, or some local disease, as pharyngitis or pneumonia followed by headache, restlessness, delirium, great dyspnea, cyanosis and rapid and feeble heart action. Coma terminates the case in from one to five days. In still another class of cases, without previous dyspnea or distress, there appear such symptoms as headache and signs of intoxication, and these are followed quickly by deep and fatal coma. (Frerichs.) The causes of diabetic coma are not known, but no doubt it arises from various toxic states, due to the diabetic state.

Peripheral neuritis is common. It may be manifest by neuralgic pains, numbness and tingling and muscular weakness. In more severe cases diabetic tabes is present. Some forms cause lightning pains in the legs, loss of tendon reflex, paresis of the extensors of the feet, and a characteristic gait, known as steppage. Diabetic paraplegia occurs in some cases. The patient is usually despondent, even to melancholia, and in some cases general paresis has resulted.

Special Senses.—Cataract may occur. In young people it may develop rapidly. Retinitis, hemorrhages in the retina, optic atrophy and sudden blindness have occurred. The aural symptoms are otalgia, otitis media and mastoid disease.

Diagnosis.—The diagnosis is usually an easy matter. Excessive thirst and polyuria are sufficient to excite suspicion, and demand an examination of urine. The presence of sugar in the urine is convincing. In addition, however, the voracious appetite with progressive loss of flesh and strength, and other less prominent and constant symptoms and the usual complications are sufficient to remove all doubt.

Prognosis.—The prognosis must always be guarded even in mild cases. No one can tell when an intercurrent affection or the usual complications may arise and prove fatal. As a rule, the earlier in life the disease occurs, the more rapid is its course and the more surely fatal is the result. In what are termed acute cases, the course is from one to eight or ten weeks; in chronic cases from one to five years. When the disease begins comparatively late in life, it may last ten or fifteen years. Pancreatic forms of diabetes are most unfavorable. Treatment is always an important element, and should never be delayed or neglected. Many cases of diabetes are cured, but no case ever recovers without treatment. It must be remembered, however, that in cases apparently cured, the disease often returns, so that patient and physician should be on the alert.

Treatment.—The *diet* is of first importance, the object being to exclude as far as possible all foods containing starch or sugar.

Many elaborate diet tables have been prepared, and if a patient has money he can indulge in a luxurious diet without the use of carbohydrates. The following simple diabetic menu is given by Dr. Pepper:—

Breakfast or Supper.—Tea, lemonade (no sugar), soft boiled eggs, broiled chop, beefsteak or any fish, raw tomatoes or onions with vinegar, a very little toasted bread or biscuit, butter, cream.

Dinner.—Meat (fat), string beans, cauliflower, lettuce, game (except their livers), cheese, nuts (except peanuts and chestnuts).

Foods Allowed in Diabetes.—*Soups and Broths* made of meat of any kind without vegetables, ox-tail and turtle soup, gumbo, curry.

Eggs in any form.

Crustaceans.—Crabs, lobsters, shrimp.

Fresh fish of all kinds and fish roe. Caviare, anchovies. Salt fish, cod, mackerel and herring may be allowed, unless they increase thirst too much.

Fresh meat.—Fowl and game of all kinds. Ham, bacon, smoked beef tongue, sweetbreads, kidneys.

Fats.—Olive oil and all animal fats and oils, such as butter, cream, cod-liver oil, bone marrow.

Klemperer highly recommends fatty substances in large quantities, with a view to restricting nitrogenous destruction, and the free use of butter is also urged, and eggs.

Vegetables.—Sauerkraut, lettuce, sorrel, mushrooms, water cresses, spinach, chicory, celery, cucumbers, mustard cress, and pickles of various sorts (except sweet). The following vegetables are allowed by some writers, prohibited by others: Green French string beans, asparagus, summer squash, onions, leeks, carrots, cauliflower, cabbage, sauerkraut, coleslaw, kohl-rabi, parsley, parsnips, eggplant, artichokes.

Osler says that because potatoes contain somewhat less starch than is found in bread, they may sometimes be allowed in moderation when the latter is found to disagree. Germain Sée gives five ounces of potato meal daily as a substitute for bread.

The breads made from flour especially prepared for diabetics are gluten bread, bran bread, almond bread, inulin bread and soya bread. Many of these are unpalatable and no doubt fraudulent. The crust of a French roll was first recommended by Flint.

Fruits.—Lemons, oranges and nuts (except chestnuts).

Beverages.—Milk enough for cooking purposes; tea and coffee, sweetened with glycerin or saccharine; alkaline mineral waters (Saratoga, Vichy, Seltzer water), simple water with a slight amount of brandy, and acidulated drinks. Also Bass's ale, in which all the sugar is converted

into carbonic acid and alcohol. Beer, cider and champagne and sweet wines should be prohibited. Saccharine, levulose or glycerin may be substituted for sugar.

Miscellaneous. — Kidneys, tripe, pig's feet, truffles, mushrooms, sweetbreads, terrapin.

Cheese. — Cream cheese, milk curds.

Jellies made of gelatin, calf's foot, with wine, but unsweetened except with saccharine, coffee jelly, lemon jelly. Among other food substances to be avoided are liver, crabs, lobsters and oysters.

A rigid diet should not be adopted at once, but one article prohibited after another, being cut off gradually. Any diet that improves the glycosuria at the expense of the patient's nutrition and strength must not be continued. In most cases proper dietetic measures are followed by prompt results and often permanent improvement, at least as long as a careful diet is maintained. The skimmed-milk diet once popular in diabetes has not given general satisfaction.

Hygienic measures must not be overlooked. The most important of these are freedom from worry and excitement, moderate systematic exercise, plenty of fresh air and sunshine, a temperate and equable climate, daily bathing and grooming of the skin, flannel worn next to the skin the entire year, and well-ventilated sleeping apartments.

Therapeutics. — **Phosphoric Acid** (1x). — This drug causes polyuria, and is the chief remedy in diabetes insipidus, and is unquestionably curative in diabetes mellitus, as the experience of the author and many others testify. I have radically cured several typical cases with this remedy alone, generally using the 1x or 2x dilution. I consider it only of value in the early stages. In old cases it seems to have but little if any effect. It is chiefly useful in cases of nervous origin, the disease apparently resulting from mental overwork, worry or sexual excesses; and neurasthenic symptoms constitute an important feature. Phosphoric acid is especially useful in *phosphatic diabetes*.

Uranium Nitrate. — This drug has been highly recommended. Hughes says, "It is best suited to cases originating in dyspepsia or assimilative derangement, while Phosphoric acid excels it where the starting point of the disease was in the nervous system." Proving's show that it will cause glycosuria. The low triturations give best results.

Arsenicum alb. — Cachexia, anemia, eruptions on the skin, carbuncles, gangrene, edema of the legs. The well-known indications for Arsenic — great thirst, restlessness, anxiety and dyspnea — are important, and frequently present in cases presenting the conditions pre-

vously mentioned. The third trituration is mostly employed. *Arsen. iod.* (3x) is also recommended. With old school the bromide of Arsenic is very popular.

Arg. met. Hahnemann says, some forms of diabetes may be cured by silver if the other symptoms correspond to the symptoms of this remedy. Rückert mentions a case which he cured by Argent., but which died of phthisis afterward. He mentions: urine turbid, of a sweetish taste and profuse, especially at night; scrotum and feet edematously swollen; anxiety and pressure in the pit of the stomach, and want of breath. (Raue.) I prefer the thirtieth dilution, but freshly made low dilutions sometimes act better.

Plumbum is useful in diabetes, but especially so when there are indications of a developing exudative nephritis. Hering considered it a very important remedy, and gave the following indications: Lowness of spirits, anguish and melancholy; diminution of sight; dryness of mouth; dry, cracked tongue; suppuration of lungs; hectic fever; impotence; dryness and brittleness of skin; gangrene. The sixth trituration is the best preparation to use. *Plumbum iod.* (3x) is preferred when there are indications also of nephritis—albuminuria, tube casts and uric acid crystals.

Asclepias vinetoxicum.—Hughes relates the following interesting facts: "It seems that a diabetiform complaint among sheep was traced to their feeding on asclepias, and that the conjecture was confirmed by experiments made in the veterinary school at Vienna. The administration of the juice to sheep induced diuresis and violent thirst. Nothing is said, however, as to the presence of sugar in the urine. Five persons attacked with diabetes mellitus were relieved by taking *Asclepias* 6th dilution. One of them, whose urine contained 60 grammes of sugar to the liter, found the quantity reduced to 60 centigrammes per liter under the influence of this remedy, $\frac{1}{100}$ of the original quantity."

Lactic Acid (3x).—Numerous cases of diabetes mellitus are reported as having been cured by this drug. It is especially useful in cases originating in gastro-hepatic disturbances. Its symptoms are: Copious and free urination; urine light yellow and containing sugar; voracious appetite; thirst; nausea; constipation.

The following remedies may be indicated and prove useful: Arg. nit. (30x), Apis (6x), Carb. ac. (3x), Con. (3x), Eup. purp. (1x), Fluor. ac. (3x), Helon. (1x), Iod. (3x), Jab. (1x), *Kali brom.* (1x), Kali nit. (3x), Kreos. (3x), Lycopus (1x), Lyc. (30x), Merc. sol. (3x), Natr. mur. (30x), Nat. sulph. (6x), Nitr. ac. (6x), Nux. v. (3x), Sil. (6x), Squilla (3x).

DIABETES INSIPIDUS.

Synonyms.—Polyuria, Diuresis, Hydruria, Polydipsia.

Definition.—A chronic constitutional disease characterized by the passage of large quantities of pale, watery urine, free from sugar and albumin.

Pathology and Etiology.—The exact nature of the disease has not been ascertained. It is supposed to be of nervous origin and immediately due to a dilatation of the renal vessels, the result of paralysis of their muscular coat, caused by derangement of innervation, as “the condition can be induced experimentally by irritating a spot in the fourth ventricle, or by section of portions of the sympathetic nerve.” (Bernard.)

There are no constant or characteristic lesions. The disease is more frequent in childhood and adolescence, especially in males. It is sometimes hereditary, and congenital cases are on record. The disease is often the result of nervous influences,—shock, fright or some form of sudden mental excitement, and may be of traumatic origin, especially following injuries of the brain and spinal cord. It may follow infectious diseases, sunstroke, intemperance, exposure to cold and the rapid drinking of large quantities of fluids, more especially cold drinks.

Symptoms.—A gradual onset is the rule, though in cases following fright or mental shock the disease may develop rapidly. The two most important symptoms are excessive thirst and the increased flow of pale, watery, slightly acid urine, the amount varying from one to five or six gallons in the twenty-four hours. The specific gravity ranges from 1.001 to 1.007. Sugar and albumin are absent. While the percentage of solids is lessened, the total is usually about normal, and may even be increased. The appetite is increased, but not voracious. As a result of the polyuria the skin and mucous membranes are abnormally dry, as in genuine diabetes, and the bowels are constipated, the feces being hard and dry. Grave constitutional symptoms are very rarely present. The nutrition keeps fairly good, but after a while, if the polyuria is not arrested, there is great loss of flesh and strength. Disturbances of digestion, due to scanty digestive secretions, are not unusual. A variety of nervous symptoms may be observed. These are of a neurasthenic or hysterical character. Headache, mental irritability and insomnia are common.

Diagnosis.—The diagnosis is easy, depending upon the passage of large quantities of urine of a low specific gravity, free from sugar or albumin.

Prognosis. — Spontaneous cures result in a few instances, and in most cases careful treatment will bring about recovery, sooner or later, but the disease is often very persistent, lasting even forty or fifty years. The general health usually remains fairly good. Death rarely results from the disease, but may occur from some intercurrent complicating malady. Polyuria associated with grave cerebral or abdominal disease and resulting fatally, is hardly to be considered as a true diabetes.

Treatment. — Moderate physical exercise and favorable hygienic and congenial surroundings are desirable. Especially should all mental influences be favorable. As little drink should be taken as necessary to relieve the tormenting thirst. Acidulated drinks are grateful. An exclusive diet of meat and hot water is recommended. The constant galvanic current may be employed, one pole being applied to the back of the neck, the other pole to the lumbar region. The old school rely largely upon Valerian and its compounds, antipyrin and the bromides. Ergot is also highly recommended. The homœopathic remedies required and their indications are the same as have already been given under Diabetes Mellitus, Phos. acid (low) being the chief remedy.

RACHITIS.

Synonym. — Rickets.

Definition. — A constitutional disease of infancy, characterized by impaired nutrition and changes in the bones, and cartilages, causing deformities, also involving the ligaments, muscles and other anatomic structures.

Pathology. — There is a derangement of the nutritive processes which retards and otherwise modifies the growth mainly of the bones, more particularly those of the skull, the long bones and the ribs. The first may escape if the disease sets in after the middle or end of the second year. The long bones soften and remain flexible. Longitudinal section shows the principal seat of changes to be at the junction of the epiphysis with the shaft. The layers of bone, more especially the outer, are greatly thickened, much softened, and their margins irregularly notched.

The epiphyseal cartilages undergo rapid proliferation, and form thick, soft cushions, which by their projection, may present evident bulging. The periosteum is thickened and easily separable from the shaft. Beneath the periosteum, the subperiosteal tissue is seen to be soft and vascular, resembling spleen pulp. This subperiosteal thickening is best marked in the middle of the shaft of the bones, giving to them a spindle shape. There is regularly delay or arrest of ossifica-

tion processes, and in the bones the organic ingredients may be reduced to two thirds of their normal proportions. The cranial bones show areas of delayed ossification (craniotabes) even to a disappearance of the cranium in places, with consequent depression and deformity. The frontal and parietal eminences are exaggerated, while the top of the head and the occiput are flattened, giving a box-like shape. The fontanelles remain open long, until the second or third year of life, while the edges of the bones, where they come together to form the sutures are thickened, though soft and yielding.

Rachitic bones are regularly soft, spongy and vascular, especially near the epiphyses and beneath the periosteum. If recovery takes place, the bones become hard, and ossify; the various deformities present remain. In addition to the box-shaped cranium, there may be spinal curvature, deformed pelvis, knock knee, bow legs, etc. Chemical analysis has shown that rachitic bones may contain less than half the normal percentage of lime-salts. The liver and spleen are usually somewhat enlarged and sometimes also the mesenteric glands.

Etiology.—Rickets occurs during the first and second years of life; rarely before the sixth month. It may occur congenitally, but is presumed not to be hereditary in the true sense of the term, rather resulting from ill health and malnutrition caused in both mother and child by unfavorable hygienic and dietetic conditions. The disease occurs especially in tenement-house children, from the combined effect of bad air, lack of sunlight and poor food. The most common of the dietetic errors that may lead to the disease are premature weaning, the use of artificial and proprietary foods, especially those composed mainly of farinaceous and starchy ingredients, irregular feeding, breast milk, poor in quality from prolonged lactation, and nursing during pregnancy. Depriving the system of sufficient fat is said to develop rickets. The disease is more common in Europe than America, and is naturally a disease of the city rather than the country. It is claimed that in Vienna and London fifty to seventy per cent of all children brought to the clinics are rickety. Negroes and Italians have an especial tendency to the disease.

Symptoms.—The onset is slow. In most instances gastro-intestinal disorders precede any evidences of bone change. Nausea and vomiting, diarrhea limited to the first part of the day, with scanty colorless stools, or offensive stools containing partly digested milk, and flatulent distention, causing the belly to be prominent. Often there is profuse sweating, especially about the head and neck, mild degree of fever, as the result of which the child is prone to throw off the bed-clothing, and there is evident discomfort in being handled, due to a ten-

derness both over the bony surfaces and the soft parts. This general soreness is very suggestive. The child is languid and shows no disposition to use its limbs, or to walk or play. There may be attacks of screaming at night, and restlessness, with an intermittent temperature and splenic enlargement. Teething is usually delayed and the teeth, when cut, may be ill-formed, small, or irregularly crowded, and decay rapidly. The muscles become weak, and the patient flabby and anemic. Usually within two or three weeks the bone changes already described under pathology become manifest. These are seen first in the ankles, wrists, ribs, and cranium. The epiphyseal ends of the bones are swollen; the bones are liable to curvature, and "green-stick" fractures may be caused by slight injuries. The ribs are rarely affected. Swellings or nodules occur at the costo-chondral articulations, giving what has been termed the "rachitic rosary." The transverse diameter of the thorax in front is lessened. The lateral portions of the thorax being drawn inward at portions corresponding with the insertion of the diaphragm. This causes the lung exposed to be interfered with and results in a bulging of the sternum giving the so-called pigeon or chicken breast. The clavicles may be thickened and distorted, even fractured. Curvature of the spine and pelvic deformities are not uncommon. Changes in the cranium have already been sufficiently described. Persons who were rickety in childhood are usually stunted and dwarfed.

The nervous symptoms frequently associated with rickets are restlessness, peevishness, irritability, convulsions, tetany and laryngismus stridulus.

The rickety child is weak and susceptible to attacks of various diseases of childhood. The most frequent complications are bronchial catarrh and broncho-pneumonia, largely due to weakness of the respiratory organs, the result of deficient lung expansion. Atelectasis and emphysema also occur. Chronic hydrocephalus is not an unusual complication.

Diagnosis.— In typical cases the diagnosis is easy. In some instances there may be doubt, but a careful study of the history of the case, the gastro-intestinal disorders, and the bone changes are usually sufficient to establish the diagnosis.

Prognosis.— Rickets never prove fatal, but death is quite liable to result from intercurrent gastro-intestinal or pulmonary disorders. The disease usually terminates in recovery, save the permanent deformities remaining, in from one to five years. The possible ultimate effects of the thoracic, spinal and pelvic deformities must not be overlooked.

Treatment.—When there is reason to anticipate the bearing of a rachitic child, prophylactic measures should be promptly instituted. These consist in administering such food to the mother as will with proper hygienic surroundings keep her health at the highest possible point. The food should also be selected with a view of favoring the normal nutrition of the fetus, especially in the development of bone. In the treatment of a rickety child, hygienic measures are of first consideration, and of these, diet is of chief importance. “No well-fed child has rickets” (Tooker), and when the disease becomes manifest, it is certain that there must be something wrong about the food. If the child is at the breast, and the mother's milk is poor, or the child does not thrive, a wet nurse should be procured. If over five or six months of age, an artificial food is usually the best. Peptonized cow's milk is the safest food to try at first. Anders recommends diluting sterilized milk with barley water. A heaping teaspoonful of barley flour is poured into 25 teaspoonfuls (3iij) of water, and when the mixture is lukewarm, 10 or 15 drops of diastase (Forbes) are added to it, the gruel in a few minutes becoming much thinner from the digestion of the starch. If cow's milk does not give satisfaction, then resort must be had to cereals or to malted foods. Generally speaking, carbohydrates are to be avoided and proteids given freely. Meat juices properly prepared are often desirable as food in connection with milk, eggs or the cereals. Prepared foods containing animal ingredients sometimes answer the best purpose. Eskay's albuminized food is an excellent preparation. Food should be taken regularly, and care be taken that the digestive organs are not overtaxed. If the stools are green or curdy, there is imperfect digestion, and the food must be changed or reduced in quantity.

General hygienic measures are of great importance. Fresh air and sunshine are indispensable. Therefore, the child should be kept out of doors as much as possible, even in cold weather, being careful that it is at all times warmly clothed. The decubitus should be frequently changed, but at the same time the child should be handled as little as possible. It should not be allowed to walk or even sit up unless properly supported, in order to prevent bony deformities.

Therapeutics.—The old school relies chiefly upon phosphorus, calcium salts, iron and cod-liver oil. The last named is simply a nutrient. It is, however, recommended by Raue, who says it is best used in the form of a trituration with sugar. It is not at all necessary to give the oil by the spoonful. The first-named remedies are frequently homœopathic to the conditions presented. Tyson and others particularly recommend the *phosphide of calcium*, and in so doing they

agree with the homœopathist who finds in *Calcareæ phosphorica* his chief remedy. *Phosphorus* is also a homœopathic remedy, but is rarely used except when combined with Calcium or iron, *ferrum phosphoricum* being an invaluable remedy. Rickets being a disease of nutrition, the tissue remedies are chiefly indicated. They are most useful in the lower triturations. I almost invariably employ the sixth decimal.

Calcareæ phosphorica (6x trit.). — The cranial bones are thin and brittle, and crackle when pressed upon; delayed closure of fontanelles; sallow, earthy complexion; retarded dentition, especially second dentition; emaciation; lateral curvature; swollen condyles in both extremities; spina bifida; non-union of broken bones; systemic dyscrasias. Shrunken, emaciated children; hard lumps on the cranium; neck thin and weak, so that it can not hold the head up; the child always has more or less indigestion; vomiting of undigested food, especially milk; colic after eating; green, mucous stools, etc. This remedy should be given the mother during pregnancy, if her condition is such as to cause anticipation of a rickety child.

Calcareæ carbonica (6x to 30x trit.). — This is a tissue remedy, and invaluable in the treatment of all conditions resulting from malnutrition. Defective growth and development, both mental and physical, especially of the osseous system; open fontanelles; slow dentition, and consequent troubles; even convulsions; hydrocephalus; emaciation; skin flabby, hanging in folds; marasmus; patient weak and sluggish; curvature of the spine, especially in dorsal region; child slow in learning to walk and talk. *Tabes dorsalis*; abdomen enlarged and bloated; milk disagrees, may be vomited in curds, or pass the bowels in the same manner. Sour vomiting; sour or undigested stools. "Calc. carb. meets more directly the objective symptoms, while calcarea phos. more the subjective ones. The first acts more on the blood and the soft tissues; the other, the osseous and the harder tissues. The one acts superficially; the other more profoundly. Whichever remedy is used, it must be given systematically and persistently for a long time." (Tooker.)

Silicea (6x to 30x trit.). — An invaluable remedy in rickets. The silicea child is much emaciated and scrawny, but not soft and flabby like calc. carb. The abdomen is also large. The head too large for the body; sweat on the head; open fontanelles; earthy complexion; caries and necrosis; spinal curvature; exostoses; enchondroma; suppurative processes in bones; fistulous openings.

Ferrum Phosphoricum (3x or 6x trit.). — I have used this drug chiefly where, with phosphorous symptoms, there was a pronounced anemia and other indications for iron. Goodno finds it more

efficient where the limbs are tender and motion excites pain—symptoms suggesting scorbutus—and for the bronchitis and bronchopneumonia.

Fluoric acid is an invaluable remedy in rickets, and in its clinical effects reminds us of Silicea and Calcarea. It affects chiefly the long bones; bony growths on ends of long bones; caries with a thin excoriating discharge; bone fistulæ; exostoses; emaciation; sallow complexion; dyscrasia. I have had best results from the thirtieth potency.

Sulphur.—Often indicated, as in other chronic constitutional diseases. Constitutional dyscrasia (psora of Hahnemann). Often needed as an intercurrent remedy, for the purpose of arousing the reactive energies of the system, when carefully selected remedies have failed to produce a favorable effect. Eruptions on the skin; emaciation; open fontanelles, etc. This drug need not be employed lower than the thirtieth. Still higher potencies are often preferable.

Baryta Carb. (6x trit.).—Imperfect development; child dwarfed mentally and physically; glands indurated; abdomen hard and distended; face puffed; general emaciation.

Kali iod. (1x trit.).—Especially in syphilitic subjects. Distention of all bone tissues by interstitial infiltration; enlarged glands; swelling of the bones; hard lumps on the cranium; decaying teeth; tearing, darting pains in all the limbs; jerks or contraction of tendons; great emaciation; tenderness of the entire body; extremely irritable and fretful habit.

Asafetid.—Body bloated; scrofulous, bloated children, with glandular swellings. Pains accompanied with numbness of affected parts; child screams on being handled; ulcers and sores of an indolent type, looking bloody, raw and dark, and very sensitive to touch. I use the drug anywhere from the third to the thirtieth potency.

Consult also: Bell. (3x), Hepar sulph. (6x), Iod. (3x), Lyc. (30x), Mez. (3x), Merc. sol. (3x), Phos. (3x), Phos. ac. (2x), Ruta (2x), Rhus tox. (3x), Staph. (3x) and Therid. (30x).

SCORBUTUS.

Synonyms.—Scurvy, Scorbutic Purpura.

Definition.—A constitutional disease characterized by a dyscrasic state of the blood, anemia, great weakness, spongy gums, extravasations of blood, livid, indurated patches of skin, hemorrhages from the mucosa, fetor of the breath, and painful contractions of the muscles.

Pathology.—The blood is dark and fluid, the blood corpuscles and hemoglobin are correspondingly reduced. There are evidences of

profound anemia, but no leukocytosis. Ecchymoses may appear on the skin, but the most important change found, is the extravasations of blood in the subcutaneous, submucous, intermuscular, and interstitial tissues, the most characteristic being that which takes place under the periosteum of the femora. Submucous hemorrhages may lead to ulcerations. The gums are swollen and ulcerated, and the teeth sometimes drop out. The epiphyses, particularly of the lower end of the femora, may be congested, and rarely they are detached. The spleen is enlarged and soft. The kidneys, the heart, and the liver show parenchymatous degeneration.

Etiology.—Only a comparatively few years ago scurvy was looked upon solely as a disease of sailors. Even at that time, while sailors were the chief victims, the disease was more or less prevalent in armies in besieged cities, in almshouses and in prison, often assuming the form of a devastating epidemic or endemic. The disease is now comparatively rare. The prevailing opinion as to the nature of scurvy is that it is infectious, but that its development depends almost wholly upon certain predisposing dietetic and hygienic causes. Chief of these is the long-continued use of a diet in which fresh vegetables, vegetable juices and organic salts are lacking. It has been shown, however, that sporadic cases, and even epidemics, have occurred independent of dietetic causes. The next and equally important predisposing cause is unhygienic surroundings, damp dwellings, lack of sunlight, depreciated general health, depressing mental states and overexertion. The disease attacks all ages, but the old are most susceptible. More men than women are affected, but it is altogether likely that this is due to circumstances, rather than to the fact that men are more susceptible.

Symptoms.—The onset of the disease is usually slow. At first the patient shows some pallor, and becomes easily fatigued. There is swelling around the eyes, with a bruised appearance, the face is bloated and the expression sad and apathetic. The weakness progresses until there is extreme debility, and in severe cases profound anemia. There is a sense of precordial oppression and weakness and palpitation of the heart. The increasing weakness is accompanied by a sense of soreness and fatigue in the muscles that amounts to actual pain of a rheumatoid character, and affects chiefly the back and calves of the legs. The patient is emaciated and exceedingly sensitive to cold, and continually seeks the fire or puts on additional clothing. The apathy increases to almost somnolence, the patient is sad and dejected and indisposed to mental or physical exertion. The temperature is rarely elevated, and it may be subnormal. Edema of the ankles may be observed. The urine is usually of high specific gravity, and the phosphates may be

increased. Albuminuria is not uncommon. The breath is foul and the bowels are constipated.

With rare exceptions the gums are swollen, soft and spongy, with disposition to bleed easily. These changes, however, may not be observed in infants and in old people. The teeth tend to loosen and to drop out. A very sickening fetid odor proceeds from the mouth which is due to the sloughing which occurs. Mastication of solid food is impossible, and fluids are often swallowed with difficulty. The tongue is swollen. In rare cases there is necrosis of the jaw. The skin is dry and of a muddy color, blended occasionally with a greenish or greenish-yellow tinge. After a week or ten days, ecchymoses and purpuric spots appear in the extremities and spread to the trunk; they may arise spontaneously or after slight injury. They are less common under the mucous membranes and in deep-seated tissues, and are rare on the face and scalp. The muscles become indurated from extravasation of blood into their substance, and either acutely inflame, there being great local tenderness and heat, and symptomatic fever, or the process goes on more slowly without fever. Hemorrhages take place from various mucous surfaces; epistaxis; hematemesis; intestinal hemorrhage; hematuria. Hemorrhage from the lungs and kidneys occurs rarely. Occasional sloughing takes place and a slowly healing ulcer results. Subperiosteal hemorrhages may occur and engender node-like protuberances, and necrosis of bone may follow, or separation of the epiphyseal cartilage may result in young children. Cerebral and meningeal hemorrhages may occur, producing convulsions or paraplegia. The spleen is usually enlarged. Albumin is present in the urine of severe cases. The color of the urine is high and the specific gravity increased. The amount of urine secreted is diminished, and so are the solids except the phosphates, which are in excess.

Diagnosis.—This is readily made from a consideration of the etiology, the spongy, swollen gums, and the deep-seated and superficial hemorrhages.

Prognosis.—Sporadic cases always recover promptly under proper treatment, and the same can be said of endemic and epidemic cases when it is possible to establish proper dietetics and hygiene, and when the cases are not too far advanced. Severe and long-protracted cases are liable to die from pneumonia, hemorrhagic infarctions of the lung, pleurisy with bloody effusion, dysentery, acute nephritis, etc.

Treatment.—*Prophylaxis.*—Since it has become possible to transport antiscorbutic foods, such as fruits and vegetables, in hermetically sealed containers, the disease has greatly diminished among sailors and soldiers, and the free use of these foods by all classes has had the same effect elsewhere.

Diet—Fresh fruits and vegetables are indispensable, and fresh meats and meat juices are equally so, the latter being needed for their strength-giving qualities. Oranges, lemons and limes are particularly beneficial. Eggs, milk and farinaceous foods are not contraindicated, given in connection with fruits and vegetables. Of the latter, potatoes, water cresses, raw cabbage, lettuce and sauerkraut are especially mentioned as antiscorbutic.

Hygiene—Hygienic and sanitary measures are important. Fresh air and sunshine, out-of-door life and well-ventilated, dry houses in healthy localities are essential. Local treatment may be desirable in some special cases, especially when the sloughing and ulceration need attention, but we should remember, as Bartholow says, that the various manifestations and localizations of the disease are due to the cachexia; no time should be wasted in treating them, but every effort put forth to improve the condition of the body in general. There is no harm, however, in frequently cleansing the mouth with a pleasant antiseptic solution such as borolyptol or listerine. A solution of permanganate of potash or of boric acid may be used. Of course hemorrhagic and other complications must be met by the usual measures.

Therapeutics.—**Merc. sol.** (3x trit.).—The pathogenesis of this drug gives a perfect picture of a typical case of scurvy, and its use has often proved of great benefit. Among the symptoms we find spongy, bleeding gums of a sickly appearance, they look white along the upper border and recede from the teeth; bluish color of the inner cheeks; fetid odor from the mouth; tongue swollen. Sinking with an indescribable malaise, obliging him to lie down; fetid ulcers on the legs, which speedily become putrid; spongy, bluish, readily bleeding ulcers; dysenteric symptoms.

Nitric acid (6x dil.).—Swelling and sponginess of the gums; ptyalism; easily bleeding gums; great fetor of the breath; teeth loose in their sockets.

Muriatic acid (3x dil.).—Extreme debility, patient slides down in bed; scorbutic swelling of the gums; fetid breath.

Natrum mur. (30x dil.).—As is well known this drug causes a deterioration of the blood, resulting in inflammation of a scorbutic nature, and from which arise various ulcers and eruptions on the skin, as well as destructive inflammations of mucous and glandular tissues and conditions generally pointing to a distinct dyscrasia of a scorbutic character. Putrid inflammation of the gums, which are swollen and bleed easily; bloody saliva; difficulty of talking, as if the organs of speech were weak.

Carbo veg. (30x dil.) is indicated if there is a tendency to gangrene of the lungs, and sloughing of the gums and mucous membrane of the

mouth; feeble, irregular pulse; skin cold and clammy; excessive prostration.

Rhus tox. — Petechiæ and ecchymoses; rheumatic pains in the muscles and joints; indurations under the muscles, and swelling of the joints. I prefer the third dilution,

Consult also: *Arsen.* (30x), *Cinch.* (30x), *Fer. phos.* (6x), *Hydras.* (3x), *Kreos.* (3x), *Lach.* (6x), *Nux vom.* (3x), *Phos.* (30x), *Phos. ac.* (3x), *Staph.* (3x), *Sulph. ac.* (2x), *Sulph.* (30x).

INFANTILE SCORBUTUS.

Definition. — A constitutional disease of infancy simulating the scorbutus of adults, and often associated with a rachitic condition.

Etiology. — Infantile scurvy may occur at any period after four months, but it is most common between the ninth and fourteenth months. It is caused almost invariably by an exclusive diet of proprietary foods or of condensed milk. It has also followed the prolonged use of sterilized milk, either alone or in combination with other artificial foods.

Pathology and Symptoms. — From Barlow's graphic description of the disease and the able researches of Northrup it is evident that the condition consists essentially in a subperiosteal hemorrhage causing thickening and tenderness in the shafts of the bones beginning in the lower extremities, but invading also the forearm and arm, more rarely the scapulæ, vault of the cranium and face. The muscles may also be the seat of extravasation. The parts are swollen, and the skin over the swelling is usually tense and shiny, is not hot to the touch, and pitting on pressure does not occur. The tenderness is exquisite, and is increased by motion. As the swelling subsides, thickening of the shaft of the bone is found. If teeth be present, the gums may swell and become spongy. In rare instances fracture of the bones and separation of the epiphyses occurs. The lesions are symmetrical, joints remaining free. The sternum and adjacent cartilages and a small portion of the contiguous ribs may be sunk bodily back as though subjected to violence. There may be a sudden prolapsus of an eyeball. The child becomes anemic, irritable, and can not bear to be handled or touched. The symptoms of rickets may coexist. A pseudo-paralysis results from the pain caused by a contraction of the muscles pulling upon their tender periosteal attachment. Ecchymoses in the form of petechiæ appear under the skin surface, and particularly about the eyes, and hemorrhage occurs from the various mucous membranes. Hematuria is sometimes an early symptom.

Diagnosis. — The diagnosis from rickets may be established by bearing in mind the essential features of infantile scorbutus as described by Barlow: “(1) Predominance of lower-limb affection, in which there is immobility going on to pseudo-paralysis; excessive tenderness; general swelling of the lower limbs; skin shiny and tense, but seldom pitting, and not characterized by undue local heat; on subsidence revealing a deep thickening of the shafts, also liability to fracture near the epiphysis. (2) Swelling of the gums about erupted teeth only, varying from definite sponginess to a minute, transient ecchymosis.”

Prognosis. — This is favorable if proper diet and hygiene can be enforced.

Treatment. — The treatment is essentially the same as in scurvy. Fresh milk with meat juices and fruit juices, especially oranges and lemons constitute the necessary diet. Vegetables may also be included. Plenty of fresh air and sunshine are requisite. The medicines usually required by the indications are about the same as those already mentioned for scurvy. *Belladonna* (3x) is very often the first remedy required. *Ferrum phos.* (6x) is often invaluable, and *Phosphorus* (30x) is frequently indicated.

PURPURA.

Definition. — A general term including all extravasations of blood into the skin and mucous membranes not resulting from traumatism. Small hemorrhagic spots are known as “petechiæ;” larger hemorrhages are called “ecchymoses.”

Varieties. — (1) Symptomatic purpura; (2) Simple purpura (*purpura simplex*); (3) Arthritic purpura; (4) Hemorrhagic purpura (*purpura hemorrhagica*). Various degrees of intensity are met with in each variety.

1. Symptomatic Purpura.

This form of purpura occurs secondarily in the course of various diseases, and is mentioned in connection with those diseases elsewhere considered. It may be caused by: (a) Severe infectious diseases, such as acute yellow atrophy of the liver, snake-bites, typhoid fever, pneumonia and the exanthemata. (b) Pernicious anemia, leukemia, pseudo-leukemia, scurvy, hemophilia, and exhausted and cachectic conditions, and severe continued jaundice. (c) Embolism with malignant endocarditis and with multiple sarcoma. (d) Nervous affections, as locomotor ataxia, acute and transverse myelitis, and hysteria. (e) Mechanical causes, straining efforts, intense paroxysms of whooping cough, and

violent convulsions. (*f*) From certain drugs, such as potassium iodide, chloral hydrate, quinine, copaiba and more rarely ergot, mercury, and belladonna. It may also occur in newborn children, especially when there is congenital syphilitic change in the arterial walls.

2. Simple Purpura.

This is the mildest form of purpura. It occurs chiefly in children near the age of puberty. The cause is unknown. The eruption on the skin takes the form of petechiæ, ecchymoses, or vibices, the last so-called because the hemorrhagic eruption appears in streaks. Usually the eruption first makes its appearance in the hair follicles. It occurs in a series of crops, the lower limbs being most affected. Its color ranges from a deep red to a livid bluish tint, and as it fades away assumes a yellowish-brown and then a yellow color and finally, after a few days, disappears. In rare cases bloody serum is effused into bullæ or large blebs.

3. Arthritic Purpura.

Synonyms.—*Peliosis Rheumatica*, Schönlein's Disease, Rheumatic purpura.

Etiology.—The cause of this disease is unknown. An antecedent history of rheumatic fever is frequently obtained, but the exact relationship of the disease to rheumatism has not been absolutely settled. It occurs usually in young people, between the ages of fourteen and thirty, and is more frequent in males than in females.

Symptoms.—The disease usually begins with angina, malaise, moderate fever, and slight articular pains. The joints are swollen, painful and very tender. The articular pain and swelling are due to small hemorrhages in and about the joints. More rarely arthritis with serous or hemorrhagic effusion occurs. There is purpura, which may occur alone or be associated with urticarial wheals or exudative erythema. Hemorrhagic pemphigus may also occur. The neighborhood of the affected joints, and the legs are chiefly affected by the purpura, but it may occur elsewhere. Epistaxis may occur; other hemorrhages from mucous surfaces are rare. Severe cases are often associated with hematuria and hemorrhagic nephritis with edema. There is usually some edema, which may be extensive in severe cases. The urine may contain albumin. Endocarditis is sometimes a complication. Sloughing and gangrene of the uvula or tonsils may occur.

Diagnosis.—The polyarthritis, the combination of purpura and urtica and the edema are, combined, the chief diagnostic features. It can not always be distinguished from rheumatism.

Prognosis. — The prognosis is good, though a fatal nephritis or cardiac disease may occur. The duration is from ten days to three weeks, but annual relapses at the same time of year for several years are not uncommon. Henoch and Couty have described a form of rheumatic purpura (Henoch's purpura) which occurs mostly in children, but also in adults, characterized by vomiting, diarrhea and intestinal pain in addition to the usual symptoms of arthritic purpura. In rare cases there is intestinal ulceration, and perforation with fatal peritonitis. Acute enlargement of the spleen has been observed. The purpuric symptoms are often scanty or entirely wanting. The prognosis is good, though serious complications are possible.

4. Purpura Hemorrhagica.

Synonym. — Morbus Maculosus Werlhofii.

This is the most important and gravest form of purpura. It includes all cases of purpura having a disposition to bleed from the mucous membranes and into internal viscera. Symptomatic purpura may therefore belong to this variety.

Etiology. — The causes are not well understood. The disease occurs in connection with malaria, rheumatism and infectious diseases, but may occur entirely independent of these affections in apparently healthy subjects. It, however, attacks chiefly those who are in poor health, especially females. It is most common between the fifteenth and twentieth years of age, but occurs at all ages.

Symptoms. — There may be prodromal symptoms for several days, the patient complaining of malaise, headache, anorexia, depression, and possibly some fever, with rheumatic pains and some swelling of the joints. More often, however, the onset is abrupt, epistaxis being the first symptom. Soon petechiæ and ecchymoses appear on the lower extremities and body, less on the arms, and rarely on the face. These vary in size from a pin's head to a pea, and change in color successively from bluish-red to greenish, brown and yellow. It is common for fresh crops to appear at varying intervals during the disease, which brings about the various colors of the different ages of these maculæ. Extensive ecchymoses may be followed by gangrene of the skin. The epistaxis persists, and soon there are also hemorrhages from the mucous membranes — the mouth, stomach, kidneys, intestinal tract and uterus. The brain and serous membranes may also be seats of hemorrhage, apoplectic symptoms indicating the first. The hemorrhages may be moderate, or they may be so profuse as to induce a fatal anemia. The patient grows weaker and complains of pains in the limbs, loins, abdomen

and chest. There is pain, and swelling of the joints, especially of the hands, the feet and the knees, may be observed. In rare cases, ankylosis or arthritis may develop. The temperature may be normal, but usually ranges from 101° to 103° F. The pulse is accelerated, and in severe cases is small and very rapid. Sometimes a typhoid condition supervenes. A rare accident is the occurrence of sloughing and perforation of the intestines, produced by hemorrhagic extravasations into the tunics of the bowel.

There is a rare acute variety known as *purpura fulminans* which more commonly occurs in young adults. It follows a malignant course, and proves rapidly fatal, only a small percentage of cases recovering. The symptoms are all more intense, and the patient passes into stupor, there is restlessness and delirium, and death occurs in coma or from visceral hemorrhages.

Diagnosis. — The diagnosis of hemorrhagic purpura is easy. It is most liable to be confounded with scurvy, but the changes in the gums and other characteristics of scurvy are absent. The purpura of eruptive fevers may cause some doubt, but in these the history of a prevailing epidemic, the high temperature, etc., ought to be sufficient to differentiate.

Prognosis. — The prognosis in mild cases is good, but in the severe forms it is very grave, though except in malignant cases, recovery is the rule. Cases occurring in broken-down subjects are doubtful.

Treatment. — This is principally medicinal and purely symptomatic. The chief remedies are *Arsen.* (3x), *Carb. veg.* (30x), *Crotal.* (2x), *Ham.* (1x), *Kali iod.* (1x), *Lach.* (6. to 30x), *Naja* (6x), *Natr. ars.* (3x), *Phos.* (6x), *Rhus tox.* (30x), *Secale* (2x), *Sulph. ac.* (2x), *Tereb.* (1x). Of these *Arsen.*, *Crotal.*, *Lach.* and *Phos.* are most often required. Local hemorrhages may be so severe as to sometimes require local measures. For the remedies for special hemorrhage see the appropriate articles in this work.

HEMOPHILIA.

Synonym. — Bleeder's Disease.

Definition. — A constitutional inherited affection characterized by a tendency to uncontrollable hemorrhage, occurring either spontaneously or from slight injury.

Pathology. — The pathology is unknown. In some instances the walls of the blood vessels have been found thin with a fatty degeneration of the intima, and in many there is deficient coagulability of the blood. According to Henry vasomotor influences also play an important part in causing an attack, as is shown by the frequent flushings of

the face preceding an attack, and also by the fact that bleeding may follow emotional excitement.

Etiology. — The etiology of this condition is decidedly interesting. "Hemophilia is more distinctly hereditary than any other known disease." (Anders.) In rare instances the disease is acquired. What is known as Nasse's law is that the daughter (not herself affected) of a bleeder transmits the tendency to her sons, who become bleeders; her daughters do not suffer, but in turn transmit the disease to their sons. Women, however, are sometimes bleeders; according to Virchow one woman is affected to every seven men. Not all the children of a bleeding family are afflicted, while the male members are more frequently subjects than females. The families of bleeders are apt to be large, and their appearance is that of health as a rule. It is said that blondes predominate, with delicate, soft skin, and distinct distended veins. (Tyson.)

Symptoms. — These usually appear in early childhood, before the end of the second year, though in rare instances later. Legg recognizes three clinical groups: (1) Seen most frequently in men and characterized by external and internal bleedings of all kinds and by joint affections; (2) most frequent in women, and distinguished by spontaneous hemorrhages from mucous membranes only; and (3) characterized simply by ecchymoses. Usually attention is first called to the trouble by the occurrence of a persistent hemorrhage from some trifling cause, such as a slight scratch, cut, blow, the extraction of a tooth, or a minor surgical operation, vaccination, etc. In other cases the bleeding is spontaneous and without apparent cause. Uncontrollable epistaxis is one of the most frequent manifestations. Hemorrhages may occur from the mouth, stomach, ear or eyelids. They may occur, though rarely, in the interstices of organs. Subcutaneous hemorrhages evince themselves as purpuric spots, ecchymoses, and hematmata. Large ecchymoses may be succeeded by gangrene. In the female menstruation may be profuse, but parturition is rarely complicated by hemorrhage. Capillary hemorrhage may persist for many weeks, and finally result, as do profuse hemorrhages, in a few hours, in profound and sometimes fatal anemia. If, however, the bleeding is checked, reaction takes place rapidly, though repeated hemorrhages may result in permanent anemia. Arthritic symptoms are common, involving usually the larger joints and including swelling and pain, with fever, thus resembling rheumatism. These symptoms may indicate an approaching hemorrhage. These are especially liable to occur in cold, damp weather, and may result in stiffened, deformed joints. (Musser.)

Diagnosis. — Profuse or persistent hemorrhages, recurring, should excite suspicion and the family history be investigated.

Prognosis. — Hemophilia may not be inconsistent with a prolonged and busy life, but in most cases the ultimate result is fatal. The younger the subject, the more serious is the prognosis. About one half the cases die before the seventh year and only one in eight reach their majority. Boys suffer more severely than girls. Occasionally the attacks are outgrown, each one becoming milder until they disappear entirely.

Treatment. — Daughters of bleeding families should be forbidden to marry. Children in whom hemorrhages have already occurred, or those (especially boys) in whom the heredity is known, should be carefully guarded from external injuries. Minor surgical procedures, such as vaccination, circumcision, extraction of teeth, etc., should be avoided. Their system should be fortified by daily exercise in the open air, daily bathing, and other practical hygienic measures. During an attack, absolute quiet is essential. The various forms of hemorrhage should be treated in the usual manner, as described elsewhere.

We have now to consider only those remedies that are considered most useful in overcoming the constitutional condition — the hemorrhagic diathesis.

Phosphorus stands deservedly at the head of the list. It induces hemorrhages from various organs and parts of the body, the blood being fluid and non-coagulable, hence the symptom "small wounds bleed much," it being almost impossible to stop the bleeding from the prick of a pin, or from a small cut, or after the extraction of a tooth. I prefer the third dil., but have used the thirtieth with success.

Lachesis is also a valuable remedy. It also fluidizes the blood and renders it non-coagulable resulting in easy and persistent bleedings from all parts. The blood is black and thick (not coagulated), and on standing deposits a sediment like charred straw. Use from 6th to 30th dilution.

Consult also: *Erig.* (1x), *Secale* (1x), *Natr. sulph.* (6x), *Crotal.* (2x), *Crocus* (1x), *Cinch.* (2x), *Hamam.* (2x) and other hemorrhagic remedies.

SECTION VII.

INFECTIOUS DISEASES.

TYPHOID FEVER.

Synonyms.—Enteric Fever, Abdominal Typhus, Ileo-typhus, Autumnal Fever, Nervous Fever.

Definition.—An acute infectious fever due to a specific virus, the bacillus typhosis, and characterized by peculiar intestinal lesions, splenic enlargement, maculæ on the skin (rose spots), headache, delirium, diarrhea, prostration, etc.

Pathology.—The lesions of typhoid fever may be divided into two groups: (1) Primary or essential lesions, and (2) Secondary or complicating lesions.

1. **Primary or Essential Lesions.**—These are due to the direct effect of the specific bacillus (see diagnosis) upon the lymph follicles, especially of the solitary and agminated glands, being most constant in Peyer's patches, at the lower portion of the ileum, in some cases appearing nowhere else. They are invariably present in typhoid fever. They may be divided into four well-defined stages, as follows:—

(a) *The Stage of Infiltration.*—On the second day of the disease, the lymph follicles become congested and swollen. They are grayish-white in color and prominent, more especially Peyer's patches. The solitary glands may also project, and sometimes become quite prominent and almost pedunculated. The infiltration and proliferation of cellular elements continues to increase and later involves the surrounding mucous membrane, small isolated foci being also seen in the muscular, the subserous, and even the serous coats of the intestine. In these masses of lymphoid cells, the bacilli are constantly found. The height of this process, known as medullary infiltration, is reached from the eighth to the tenth day, when, in mild cases, it terminates in resolution or, as in most cases, in necrosis and sloughing. When resolution takes place, the congestion disappears, the cells undergo fatty degeneration and absorption, and the gland assumes again its normal appearance.

(b) *Necrosis or Sloughing.*—Except in mild cases the lesion progresses to such a degree that resolution becomes impossible, and necrosis

takes place. The latter is brought about by the swollen gland pressing upon and choking the blood vessels, thus inducing anemia-necrosis, and by the direct action of the bacilli. In consequence, the cells die and necrotic crusts, or sloughs, are formed and cast off, either gradually or *en masse*. This process may affect only the upper part of the mucous coat, or it may extend to and involve the submucosa, or it may extend in depth till it reaches the muscular coat, or even perforate the peritoneum. Not all the infiltrated glands necessarily become necrotic and slough, but as a rule those near the ileocecal do, and here is usually shown the most complete development of the process. The stage of necrosis begins from the eighth to the tenth day, and continues during the second and third weeks. The detachment of the slough leaves behind the typhoid ulcer.

(c) *Stage of Ulceration.* — The size and extent of the ulcer is in direct proportion to the amount of necrosis. The depth may be shallow, but it usually reaches the submucosa, or the muscular coat, which usually constitutes the floor of the ulcer. The ulcer may reach to the peritoneum and cause perforation. The walls and floor of the ulcer are composed of infiltrated glandular tissue. By the further disintegration of these infiltrating cells the ulcer may increase in size and in depth; sometimes a number of small ulcers thus extend and unite, forming one large ulcer, which may even involve the whole of the terminal six or eight inches of the mucous membrane of the ileum. In rare cases the whole of Peyer's patch sloughs leaving a perfectly ovoid ulcer, but usually the ulcers are small and irregularly oval or rounded in form. The floor of the ulcer is usually clean and smooth, the edges irregular, engorged, soft and frequently overhanging. The large intestine is frequently invaded, but perforation is exceedingly rare. The appendix may also be involved and perforation occur.

(d) *Stage of Cicatrization.* — The ulcer gradually diminishes in size, the surface becoming covered with a delicate layer of granulations, which is soon transformed into connective tissue and covered with epithelium, the resulting scar being slightly depressed. Occasionally, ulcers are seen extending in one direction while healing in another. Thus the stage of ulceration and that of cicatrization are often commingled in the same patient. The normal glandular structure of the gut is never restored. The mesenteric glands become infiltrated, enlarged, and softened, but seldom ulcerate. Those opposite the site of the most extensive ulceration in the bowel are most involved. The changes occur simultaneously with those of the intestines.

The spleen also enlarges and softens, the increase in size beginning in the middle of the first week, reaching its height at the end of the second week, the organ being twice or three times its normal size.

Hemorrhagic infarcts have been found in the spleen in four to seven per cent of cases coming to autopsy.

2. **Secondary or Complicating Lesions.**— These are due chiefly to the continued fever and to secondary infection, and are not peculiar to the typhoid process.

Peritonitis follows perforation of the intestine. It may also occur as an extension of the intestinal inflammation, or result from rupture of a softened mesenteric gland, or from rupture, abscess or infarction of the spleen.

The *liver* becomes hyperemic and swollen. There may be parenchymatous degeneration of liver cells, lymphatic nodular areas in the liver, liver abscess with pylophlebitis, and acute yellow atrophy.

In the *kidneys* there is found parenchymatous degeneration of the renal cells, more rarely acute nephritis, which may even be hemorrhagic; also miliary abscesses in which typhoid bacilli have been found. Diphtheritic and catarrhal inflammation of the pelvis of the kidney and catarrhal inflammation of the bladder may occur.

In the *respiratory organs* changes are usually found. The lungs show some degree of hypostatic congestion, and sometimes there is bronchitis or lobular pneumonia, rarely lobar pneumonia. A mild bronchitis is quite common. There may be ulceration of the larynx and edema of the glottis. Pleurisy and empyema are rare events. Embolic infarctions are sometimes present and gangrene of the lungs may occur.

Parotitis may occur during the second or third week, and may proceed to the formation of an abscess. Endocarditis and myocarditis may be present. In rare cases pericarditis with effusion of serum or of pus is found. Thrombosis of veins, especially of the femoral, causing the not very rare symptom of milk leg, may occur.

The *nervous system* presents no gross lesions. Meningitis may occur, but is very rare. The *blood* shows few, if any, important alterations.

Etiology.— Typhoid fever occurs in all countries and in all climates, being one of the most widely spread of all the infectious fevers. It is more common in the temperate zones and occurs most frequently in the summer and autumn months, hence the name "Autumnal fever." It appears to occur with greater frequency after hot, dry summers, presumably because the ground-water is low, and the constant circulation between the air in the loose soil and that above it, conveys the germs upward, and they pervade the air accordingly. This, however, is no factor in the case of epidemics which may occur at any season of the year and under any conditions of moisture. Liebermeister claims that

the relation of typhoid to the hot and dry season is due to the fact that at this season the quantity of solid matter in springs is relatively larger, that the poison, in other words, is more concentrated, and therefore more virulent. More men are affected than women, probably because of their increased exposure. All ages are liable, but those between fifteen and thirty are most susceptible. In the young the disease usually runs a shorter course, and the prognosis is more favorable. There is in this, as in other infectious diseases, an unexplainable individual susceptibility, some being more readily infected than others under the same circumstances. The strong and healthy are fully as liable to the disease as are the weak and delicate. Those having chronic catarrh of the intestinal canal are more liable to attacks, presumably because the entrance of the germ into the lymphatics takes place more easily. Epidemics of typhoid fever are usually local, being confined to a community or to an institution or to a camp or barracks, where all are under the influence of the same source of infection. Endemics may exist at any time and in any place, the source of infection being traced only with difficulty and often never discovered.

The actual exciting cause of typhoid fever is now supposed to be the bacillus typhosis, discovered by Eberth in 1880. The following condensed description of this germ and the methods of infection is presented by Lockwood. "This germ is a short, mobile bacillus, whose length is equal to one third the diameter of a red blood cell, and having rounded bulbous ends, which often present a shining appearance, due rather to alterations in its protoplasm than to spore growth, as was at first supposed. In its appearance and growth this germ closely resembles the *bacterium coli commune*, or ordinary colon bacillus, from which it is hard to differentiate it. The typhoid bacillus grows with ease in almost every kind of nutritive media, and it possesses extraordinary vitality. It may persist in drinking water or in the soil for weeks or months, and may even increase in number. It grows with great rapidity in milk without altering its appearance or taste; and so great is its tenacity of life that it may remain imprisoned in ice for months without losing its virulent properties. In the accumulations of privy vaults and sewers it finds conditions most favorable for its growth and activity. Cultures are killed by a temperature of 60° C., by carbolic acid (1-200) and by corrosive-sublimate solution (1-2500). Cultures resist drying for several days, but the growth of the bacilli is retarded by exposure to sunlight.

"The bacillus obtains entrance to the body through the alimentary canal, and enters the intestinal lymphoid tissue probably through abrasions of the epithelial coat. It has been found in the lymphoid tissue

of the intestines, in the mesenteric glands, the spleen, the liver, at times in the blood taken from the rose spots and occasionally in the urine. It has been found also in some of the complicating lesions of the disease. The bacilli are found in clusters in the intestinal contents and the stools of patients, and are thrown out from the body in this way. They are not eliminated from the lungs or the skin.

“The disease is in no sense personally contagious, cases of typhoid being received into the general wards of hospitals without risk. The bacilli being cast off only in the dejecta of the patient, it is from the stools that danger of infection arises. If the stools are thoroughly disinfected and the bacilli are killed, there is no further risk of the spread of the infection. If the stools are not disinfected, however, the bacilli will live and thrive in them, and this infected sewage, draining into water supplies, will spread the disease among those who drink of such water.

“There are three ways by which the infection of typhoid may occur :—

“The first method is by direct infection from stools. While not common, infection has occurred among attendants on the sick and among those who have washed the soiled linen of typhoid patients, the germs being transferred from infected hands to the food, and thus obtaining entrance to the body.

“The second method of infection is by contamination of the water supply. This is the usual source, and it explains the origin of epidemics of the disease that occur from time to time in towns, in institutions and in villages. Contamination of drinking water with filth and sewage will not produce the disease unless to such sewage is added the specific germ. Interesting investigations of epidemics frequently show their origin in the contamination of the water supply by the dejecta of a single typhoid patient, even though months may have elapsed between the infection of the sewage and the consequent contamination of the water supply. The source of contamination is most easily traced in small epidemics, and examples of epidemics in hotels, villages and towns so traced are to be found reported in full in medical literature. In the same way the infection may be conveyed by impure ice, after the thawing of which the germs regain their vitality.

“The third method of infection is by means of milk, in which the bacilli readily thrive, and to which they are added by impure water used either to wash the cans or to dilute the milk.

“There are three reports of epidemics apparently caused by eating meat of diseased cattle, but this mode of infection is not yet

definitely determined. Poor drainage, sewer gas and imperfect hygiene will not of themselves cause the disease. They only offer favorable conditions for the growth and development of the bacillus."

Some very recent bacteriologists maintain that the bacillus of Eberth can not produce typhoid fever without the presence and aid of the colon bacillus. (See Diagnosis.)

Symptoms.—The symptoms of typhoid fever may be divided into three stages covering the invasion, the height of the disease and the decline. However, it is customary and more convenient to refer to the various weeks of the disease. The first week represents the stage of development, the second and third weeks (in cases of average severity) the acme or height of the disease, and the fourth week in typhoid cases, the decline or defervescence. In mild cases the third week represents the decline. Prior to the onset of the disease is the necessary period of incubation, which may last from a week to ten days, or longer. During this period there may be no symptoms, but as a rule the patient complains of headache, languor and loss of appetite. The tongue may be slightly coated. Often there are muscular pains in the back and limbs.

The onset of the disease is usually very gradual, the process often being well advanced before its nature is suspected. The prodromal symptoms increase in severity, and fever is noted. The latter is presumed to mark the definite time of onset. Nosebleed is often the first characteristic symptom appearing. In some cases diarrhea comes first. The patient feels prostrated and generally wretched, and goes to bed. The fever increases from day to day, there is sleeplessness and restlessness, possibly a little wandering at night, and a slight apathetic condition during the day. Anorexia is complete, thirst is great, headache rather intense, the skin hot and dry to the touch, the tongue coated, and there may be either diarrhea or constipation. The pulse varies from 80 to 110, and is full and regular. There may be chilly sensations alternating with flashes of heat, and frequently there is a dry cough with some oppression of breathing. The abdomen is often slightly distended and tympanitic and pressure in the right iliac fossa will usually elicit tenderness with gurgling. In some cases there are colicky pains, and there may be nausea and vomiting and other gastric symptoms. The spleen is usually somewhat enlarged.

The foregoing is the description of the first week of a typical case of typhoid fever, but all cases do not follow a typical course. In the first place the symptoms may greatly vary in their intensity. This is particularly true of the prostration. Some are greatly prostrated, while others keep up, and even go out during the entire week. In

those cases known as "walking typhoid" the patient may be up and around until hemorrhage or even perforation has occurred.

The onset is not always typical. In some cases, especially in children, the disease begins with a chill and a rapid rise of temperature. In others the disease sets in with marked bronchial or pneumonic symptoms, including the chill. In others there are intense nervous symptoms resembling those of cerebro-spinal meningitis—headache, photophobia, muscular twitching and retraction of the head. In others there may be gastric symptoms, and in rare instances the symptoms of acute nephritis, with smoky urine containing albumin and casts, are the first observed. The *second week* marks a general aggravation of the symptoms. The fever remains continuously high, the evening temperature usually reaching 103° or 104° F. The pulse is more rapid and feeble, and occasionally dicrotic. The headache gives way to an apathetic state, and there may be a mild delirium, especially at night. There is a dry cough, and more or less physical signs of bronchitis. The lips and tongue are usually dry. The abdomen is more tympanitic, and if there has been constipation, it gives place to a diarrhea. Usually about the eighth day, *rose-colored spots* make their appearance on the skin of the abdomen and chest. They are usually bright red in color, and may be compared to a flea bite. They are very slightly, if at all, raised above the surface, and disappear on pressure, to return instantly after its removal. They may be very numerous, or only a few, or in some cases are entirely absent. When numerous, they usually come and go in crops, lasting from two to four days. The patient may die at the end of the second week as a result of intense nervous or pulmonary symptoms, intestinal hemorrhage or perforation. In mild cases the disease may begin to decline. The latter are known as "aborted typhoids," the intestinal lesion not having progressed to ulceration.

The *third week*, in typical cases, marks a persistence of the general symptoms. The temperature remains high, but the morning remissions are more marked, even approaching a distinct remittent type. The pulse varies from 110 to 130, and is more feeble. In severe cases there may be heart failure. The apathy is more profound and may alternate with a muttering delirium. Muscular tremor is a frequent symptom. Emaciation and prostration are more pronounced. The tongue becomes very dry, and often red and cracked. There may be retention of urine and incontinence of feces. The end of the third week marks a dangerous period. It is at this time that serious local complications are most apt to arise—lobular pneumonia, hypostatic congestion of the lungs, intestinal hemorrhage, perforation,

peritonitis, etc. The second and third weeks constitute the fastigium or second stage.

The Fourth Week.—On about the twenty-first day, in typical cases, the fever begins to decline, the pulse becomes gradually slower and stronger, the general and local symptoms gradually disappear, and the patient only complains of hunger and weakness. In some cases, however, the typical course is not followed. The symptoms continue without improvement, and sometimes become intensified, into the fifth, sixth or seventh week. At the end of this time improvement may set in and the patient recover, or there may be a fatal termination. In some cases defervescence commences, but the fever modified and irregular may continue for two or three weeks before convalescence is established. The latter class of cases may be marked by a continuation of the general symptoms, on account of unhealed ulcers, but in others the general symptoms disappear in spite of the continued fever. It is during the fourth week that recrudescences and relapses are most liable to occur.

The above describes as nearly as is possible the usual course of a typical case of typhoid fever. Many cases, however, as has already been observed, do not follow a typical course. Some of these variations have already been referred to. Others may be mentioned as we consider more in detail a few of the more prominent clinical features of the disease.

The Fever.—The main feature in typical cases of typhoid fever is the "stepladder" rise of temperature which characterizes the first week. There is a peculiar tide-like evening rise and morning fall, each day the temperature being from one and a half to two degrees higher, both evening and morning, than the preceding day. During the acme or fastigium, being the second and third weeks, of the disease, the evening rise and morning fall are continued, but the difference between the two is less marked, though often during the third week the morning fall is greater, which is always a favorable indication. During this period the temperature reaches its greatest height, usually 105° F., more rarely 106° F. When the temperature rises above the latter point, 107° to 108° F. the result is almost invariably a fatal termination.

The pulse is not usually as high in proportion as the temperature, ranging from 90 to 110, but it may go much higher. When it reaches above 120 and remains so for several days, it is an unfavorable symptom. During convalescence the pulse may become subnormal.

Brachycardia is more often a sequel of typhoid than of any other acute infectious disease. In mild cases the fastigium lasts but about one week. Usually it lasts from ten days to two weeks, and in severe cases from two to four weeks.

The fastigium is succeeded by the period of defervescence, during which the temperature falls by *lysis*. Each day the evening and morning temperature is lower than that of the preceding day, decreasing in step-like fashion, the reverse of the stage of development. This continues until the normal temperature is reached, which usually requires from one to two weeks. In some cases the morning temperature almost at once reaches normal, the evening exacerbations growing gradually less until the normal is also reached. In some cases with a decreasing morning temperature the evening temperature remains high for several days and then also declines.

From the above description the temperature of typhoid frequently presents great variations, all of which can not be detailed in a work of this character. I have seen many cases of typhoid fever where not a single characteristic of the typical course of the fever was presented, and a positive diagnosis could not be given, typhoid often not being suspected until hemorrhage or perforation occurred.

A sudden and decided drop in the temperature during the second or third week usually means an internal hemorrhage, or it may result from collapse following perforation. Rarely collapse may occur with a decided remission of temperature when perforation has not taken place. In such instances the prompt use of stimulants may save the patient.

A sudden rise in temperature during the fastigium, or later may result from indiscretion in diet or from supervening complications. Hyperpyrexia is frequently observed just before dissolution. Sudden temporary rises in temperature after convalescence, and not associated with other symptoms, are termed recrudescences. These do not present any new element of danger, but only the longer delay convalescence.

In very rare cases known as *afebrile* typhoid the temperature remains at or about normal throughout the course of the disease.

The Skin.—In addition to the rose-colored eruption previously described, and which sometimes does not appear before the tenth or twelfth day, there may also be *sudamina* present in large numbers on the skin, especially when the disease is associated with much sweating. *Petechiæ* and *vibices* are also noted in adynamic forms, and an erythema is sometimes found on the skin of the chest and abdomen. Cutaneous boils and abscesses from secondary infection sometimes occur. Peliomatous patches—the *tache bleuâtre* of the French writers—sometimes are found on the skin of the thorax, abdomen and thighs.

Profuse sweats sometimes mark a course of typhoid to such an extent as to cause a great resemblance to malarial fever of an intermittent form. These sweats are not accompanied by a corresponding

reduction in temperature. As a rule, however, the skin is dry. Edema is sometimes observed. In prolonged cases bedsores are apt to develop which sometimes spread until there is an extensive destruction of the skin, which may prove serious and even lead to a fatal termination after convalescence has begun. The hair usually falls out during and especially after the attack, but is invariably renewed.

The Diarrhea.—This usually corresponds in severity to the extent of the local lesion, but is sometimes entirely absent. The stools are grayish-yellow, and about the consistence and appearance of pea soup. *Tympanitis* is most marked in severe cases in which diarrhea is a prominent feature. It is usually ascribed to atony of the bowels.

Intestinal hemorrhage is due to the ulceration. It usually appears during the last half of the second and in the third week, but is only present in a small percentage of cases. The blood is dark and may be tarry. The amount lost may be small, or the hemorrhage may be so profuse as to be alarming, though very rarely directly fatal. Intestinal hemorrhage always adds to the gravity of the case, but is by no means always fatal. In some cases it seems to exert a favorable influence, especially when occurring early. It is always followed by a reduction of temperature.

Perforation almost invariably induces a fatal peritonitis. It occurs usually between the second and fourth weeks. It may occur in convalescence. It is more apt to occur in severe cases frequently associated with hemorrhage. It is more common in men than in women. It is characterized by sudden severe pain quickly followed by the symptoms of collapse. The abdomen becomes greatly distended, and is exquisitely tender to the touch. Death may result in a few hours.

Peritonitis of a purulent character may occur without perforation, being occasioned by direct extension of the inflammatory process from the intestinal ulcers. Where there has already been considerable tympanitis and abdominal tenderness, the diagnosis is often extremely difficult.

Complications.—Other complications than those already mentioned are numerous and varied, of which only brief mention will be made. The pharynx is often inflamed. Otitis media may be present. Parotitis may occur in the third or the fourth week, and may proceed to suppuration. *Laryngitis*, indicated by hoarseness, is an occasional complication. Bronchitis is common at any time of the disease and broncho-pneumonia and hypostatic pneumonia are often seen in severe cases.

Lobular pneumonia is one of the most serious. The consolidated area may become gangrenous. Pleurisy with effusion or empyema may occur as a consequence. *Thrombosis* of the femoral vein, more fre-

quently the left, resulting in *phlegmasia alba dolens*, or milk leg, is a complication which often greatly delays convalescence. Embolism, combined with renal, splenic and pulmonary infarcts, may be encountered.

Catarrhal or croupous enteritis or colitis may occur in severe degree.

Albuminuria is usually present in severe cases. It may result from the fever or, more rarely, be due to acute exudative nephritis, when it is accompanied by the usual tube casts. The latter is a serious consequence.

Cardiac complications, including pericarditis, endocarditis and myocarditis, are sometimes present. The latter may be a cause of sudden death.

Malaria.—Especially in malarial districts a malarial infection may complicate typhoid fever at any time, giving the course of the fever a remittent character. Such cases may be termed typho-malarial, although no such disease exists as a distinct type.

Relapses occur in from three to eighteen per cent of the cases. They usually occur within from five to eight days after convalescence, but may occur later. They are supposed to result from a reinfection of the intestine from sloughs, derived from some part above. The attack is, however, usually less severe, the duration shorter, and recovery the rule. There may be only one relapse or several, each one becoming milder than the preceding one.

Convalescence is always slow and tedious and may be interrupted in many ways. It is usually several months before the patient has fully regained flesh and strength, and can be said to be entirely well. Among the sequelæ liable to occur and to retard convalescence are neuralgia, partial paralysis, partial anesthesia, phthisis, mental disturbance, tabes, anemia and hydremia.

Typhoid fever in children has a more sudden onset, there is less danger of hemorrhage or perforation, the pulse is more apt to be rapid and feeble, the cerebral symptoms are more prominent, and the temperature reaches its maximum earlier in the disease. The fever is more remittent and is frequently mistaken for a malarial type of fever—infantile remittent. The eruption may be slight or entirely absent.

Typhoid fever in the aged usually runs an insidious and frequently fatal course. The temperature is irregular but not so high as in ordinary cases, but there is marked adynamia and serious danger from certain complications such as pneumonia, nephritis, coma, etc. The eruption is often entirely absent.

Diagnosis.—The diagnosis of typhoid can rarely be made with any degree of certainty during the first week. In many instances the

patient is not seen until at least from the third to the fifth day. Often the diagnosis must be delayed until distinctive signs are manifest. When, as in typical cases, the last are all present, the stepladder temperature, the rose-colored spots, and the diarrhea, the diagnosis is conclusive, but often one or more of these are absent. In some cases an intestinal hemorrhage is the first absolutely conclusive symptom presented. The discovery of the bacilli in the stools is presumed to be positive evidence of the nature of the disease. However, since the bacillus of Eberth has recently been found in cases of meningitis, pericarditis and other diseases, even simple febricula, where none of the characteristic features of typhoid were present, the question naturally arises whether or not the bacillus of Eberth can longer be considered as positively diagnostic. Those writers who are strongly imbued with bacteriological ideas still hold that such is the case and maintain that instead of discarding the bacillus of Eberth as solely characteristic of typhoid we should revise our knowledge of typhoid fever and include under that term any form of disease regardless of its type wherein the bacillus has been, or may hereafter be discovered, discarding the generic term of "enteric fever" as no longer adapted to the possible protean forms of typhoid fever as then recognized. Dr. Gatchell maintains that "no longer can intestinal ulceration, right iliac tenderness and 'pea-soup' evacuations be demanded in order that a diagnosis of typhoid shall be made. There can be typhoid when none of these symptoms are present. There can be typhoid with no affection of the follicles of the intestine whatever. The typhoid bacillus can produce a cholangitis, cholecystitis, meningitis, and . . . pericarditis." With the discoveries being constantly made by bacteriologists, the list of diseases in which the bacillus of Eberth is ultimately found may be greatly extended, and consequently, should we adopt the theory mentioned, it might sometime become necessary to classify very many acute diseases of varied types as typhoid fever. It would seem safer to hold such views in abeyance until the infant science of bacteriology is much older than it now is, rather discarding the bacillus of Eberth as the sole etiological and diagnostic feature of typhoid fever than to discard the fundamental knowledge we already possess which has come to us through long years of experience and scientific investigation, and which appears to be too thoroughly established to be thus easily overthrown.

It is certain, however, that the bacillus of Eberth is much oftener found in typhoid than anywhere else, and that it is always present, even though it is not solely characteristic of the disease. It therefore is a valuable, even though not a positive, diagnostic sign. Widal's test

is now being extensively employed, and is considered positive as regards the presence of the bacillus. This test simplified by Johnston of Montreal, is conducted as follows: A drop of blood from a typhoid patient, obtained by a needle prick of the ear or finger, is placed upon a glass slide and allowed to dry. A few drops of water are added to the dried specimen, and the solution is then added to a loop of bouillon-culture of typhoid bacilli in a hollow slide over which a cover-glass is placed, and sealed with vaseline. Under a high-power lens there can be seen a rapid clumping of the bacilli; and whose motions rapidly cease. It is claimed that if this peculiar reaction does not occur in a case that has been sick over a week, typhoid fever may be excluded. It is also claimed, however, that the reaction may take place anyway in persons who have previously had typhoid fever within ten years.

There are many diseases liable to assume and pursue an irregular typhoid course, presenting so many true typhoid symptoms that a differential diagnosis is often difficult.

Typhus fever is extremely rare, always occurs as an epidemic, the onset is more sudden, the symptoms more profound, maculæ appear on the fourth day which speedily change into petechiæ, the course is shorter, and the termination by crisis is abrupt.

Acute miliary tuberculosis is very frequently mistaken for typhoid fever. The pulse and respiration are more frequent, the cough, often accompanied by a characteristic expectoration, is more prominent; there are cyanosis and leukocytosis. The characteristic tide-like temperature, the eruption and the abdominal symptoms of typhoid are absent.

Malarial fever, especially the autumnal type, may greatly resemble typhoid, especially those cases where sweatings and marked remissions occur. The discovery of the malarial organism will settle the diagnosis. The same is true of the so-called typho-malarial cases, in which the ordinary diagnostic methods are even more uncertain.

Relapsing fever has an abrupt onset with rigor, high fever and pain in the epigastrium. The duration is brief, the termination abrupt by crisis, and a relapse occurs at the end of a week. The characteristic temperature and eruption of typhoid are absent.

Meningitis lacks the intestinal symptoms and fever record, but may otherwise greatly simulate typhoid, but here, while there is intestinal derangement and fever, the distinctive signs of typhoid are absent.

Concealed suppurative processes often simulate typhoid, but the distinctive signs of the latter are absent.

Prognosis.—The prognosis must always be guarded, as mild cases may take a fatal turn and severe cases may recover. The mortality is greater in hospital than in private practice. The mortality also varies

greatly in different epidemics and under different circumstances. The constant liability in all cases to perforation, peritonitis, or hemorrhage gives a grave uncertainty to the prognosis. A temperature of 106° F. is exceedingly grave, and if continuous, indicates a fatal termination. A still higher temperature is presumed to be absolutely fatal. Nervous symptoms, muttering delirium and muscular tremors, and excessive tympanites and diarrhea are not encouraging. When the fastigium is prolonged, the gravity of the prognosis is increased. Marked nocturnal remissions are favorable. A sudden, decided drop in temperature indicates danger and implies hemorrhage or collapse in most cases. "Walking typhoid" is nearly always fatal. Perforation and peritonitis are almost invariably fatal. Fat people and those suffering from Bright's disease, heart disease, or gout, and those addicted to the use of alcohol stand the disease badly. The prognosis in children under fifteen is especially favorable. After that age—after puberty—the gravity of the disease increases with increasing years until about twenty-five, when there seems to be a period of age more favorable to recovery until the age of forty, after which time the mortality again increases. The prognosis in pregnant women is grave. They usually abort in the second week. Notwithstanding there are more cases of typhoid in men than in women, nevertheless more women than men die of the disease. Recovery from relapses is the rule. The symptoms are not severe, and hemorrhage or perforation very rarely occurs.

Treatment. — *Prophylactic.* — Modern hygienic and sanitary measures properly employed will greatly decrease the prevalence of typhoid fever. The disease is largely due to defective water supply and drainage, and sanitary measures calculated to perfect these conditions will greatly minimize the prevalence of epidemics in cities. To prevent the spread of the disease, when once present, it is necessary to use methods calculated to destroy the germ, and to prevent its admission into the human body. This is best accomplished by disinfection, the most essential features of which will be briefly considered.

Disinfection. — To successfully disinfect it is quite important that all measures adopted be most vigorously and persistently followed until convalescence is established. Chlorinated lime is the most effective disinfecting agent. A solution of bichloride of mercury and permanganate of potash of each about two drachms to one gallon of water is very effective and satisfactory. Platt's chlorides are extensively used. All soiled bed linen and clothes of the patient should be soaked in the disinfecting fluid before being boiled. The mattress should be protected by a rubber sheet which should be frequently cleansed and dipped into a five-per-cent solution of carbolic acid. Those handling these articles

should frequently cleanse their hands in the disinfecting fluid. The bedpan and other utensils used for the patient should be thoroughly disinfected. The excreta, feces, urine, sputa and vomited matters should be received into a vessel containing some disinfecting fluid, to which more should be added after the discharges are received. These are to be well mixed and allowed to stand two or three hours before being emptied. Disinfecting fluid must be poured down water-closets or privy vaults occasionally. The discharges must not be emptied into any privy vault that is near the water supply. The nates of the patient must be cleansed and disinfected thoroughly after each defecation, using a cloth wet with a 1 to 2000 solution of mercuric chloride, or a 1 to 40 solution of carbolic acid. The cloths used should be immediately burned. The sick-room should be well ventilated, and as much sunshine permitted to enter as the circumstances will permit. The source of the infection should be carefully sought for. Often it is in the water or milk used by the family. These should be boiled before being used either by the patient or by members of the household.

The patient should be in isolated apartments into which only the attending physician and the nurse, with necessary members of the family, should be allowed to enter. The family should remain out of the room as much as possible, although the disease is not considered contagious.

General Management. — Skillful nursing is indispensable in the treatment of typhoid fever. As soon as the nature of the attack is discovered, the patient should be placed in bed and kept there until convalescence is well established, not being permitted to arise for any purpose. The apartments should be sunny and well ventilated. To avoid draughts of air it is well to have the ventilation kept up through an adjoining room. Two rooms, if available, are quite convenient and necessary for many purposes besides ventilation. The bed should have a hair mattress, protected by a rubber sheet, placed under the sheet. Two narrow beds should be had if possible so that the patient can be changed from one to the other as each is cleansed and freshened. In making the change the patient should be lifted on a sheet. The decubitus should be changed frequently. The use of the bedpan and urinal is absolutely necessary. Care should be taken to prevent bed-sores by keeping the sheets smooth and clean, and by washing the patient's back, hips and heels, morning and night, with a mixture of alum and salt in dilute alcohol, and after careful drying, dusting with starch powder or with bismuth. The mouth and the teeth should be kept scrupulously clean. For this purpose any mild antiseptic solution may be used. I prefer boro-lyptol, or a three-per-cent solu-

tion of boric acid. For the dry lips and tongue great relief may be obtained by frequently moistening them with glycerin and water, equal parts.

Dict. — The diet must be entirely fluid. Fresh unskimmed milk is the ideal food, and it is only in rare cases that it is not tolerated. It should be given at regular intervals. In most cases a glassful every two hours is about right. In some cases I have found it much better to give the milk hot. From three to four pints should be given during the twenty-four hours. If the milk does not digest well, as shown by nausea and vomiting or curds in the stools, it should be peptonized or diluted with pure water. In some instances it becomes necessary to feed the patient, at least part of the time, on malted milk, kumyss, or matzoon. I have found the first named entirely satisfactory. It is nourishing and easily digested, and supports the strength better in my opinion than either kumyss or matzoon. I have found it an excellent plan when milk disagreed to alternate feedings of malted milk with meat juice. There are probably others just as good, but I have never found anything to compare with Valentine's. I have used Panopepton and trophonine in several cases with satisfaction. Meat broths and beef peptonoids may also be used. However, it is best to use milk preparations where they do not disagree. Anders recommends albumin water, prepared by straining egg-white through a cloth and adding an equal part of water. It may be made pleasant to the taste by flavoring with vanilla or lemon, and with meat juice and broths. He says it will often support a patient during the most trying period of the attack. When there is extreme weakness of digestion, it may become necessary to support the strength by means of nutrient enemata, which in such cases should not be neglected. For such purpose use peptonized milk 3 oz.; meat juice 1 oz.; egg white $\frac{1}{2}$ oz.; mix. Inject every four hours, after washing out the bowels. If defervescence progresses normally, eggs, custard, rice, etc., may be added to the diet, and later, but not until convalescence is well under way, may the diet be further increased, gradually reaching a diet of solid food.

Water is the best drink, and should be freely allowed, and given at regular intervals whether called for or not. For a change grape-juice or lemon, tamarind or jelly water may be given. Alcohol should be given only when there is threatening heart failure or collapse. This is most apt to be during the second or third week of the disease. In such cases whisky should be used in full doses — one-half ounce every hour so long as required. In severe cases it may be necessary to also use hypodermics of strychnia, $\frac{1}{32}$ of a grain at a dose, in order to save the patient's life.

Management of Convalescence. — In addition to what has already been said, it may be best to more explicitly refer to a few necessary measures during convalescence, which is the most trying period of the disease to both patient and physician. The former is invariably hungry and clamoring for food, and unless great precaution is exercised by the physician, there may be a tardy convalescence due to improper diet and too early leaving the bed. The recumbent position in bed should be maintained for several days after the temperature is normal, and solid food, other than which has been previously mentioned, should not be allowed under ten days. Mutton, eggs (soft boiled) and baked potato should be the first solid food given. The patient should not be allowed to move about under two weeks, and then cautiously. In recrudescences and when there remains an irregularly high evening temperature or a diarrhea, the fluid diet, though not necessarily milk, must be persistently maintained.

Hydrotherapy. — While I have never been in the habit of using baths other than sponge baths, yet this work would not be complete without a description of the method employed in giving the cold bath treatment, which is considered by many of our best writers as the best method of treating typhoid fever. The following details and suggestions are given by Osler: —

“Every third hour, if the temperature is above 102.5°C , the patient is placed in a bath (at 70°F .), which is wheeled to the bedside. In this he remains from fifteen to twenty minutes, and is then taken out, wrapped in a dry sheet, and covered with a light blanket. Enough water is used to cover the patient's body to the neck. The head is sponged during the bath, and, if there is much torpor, cold water is poured over it from a height of a foot or two. The limbs and trunk are rubbed thoroughly either with the hand or with a suitable “rubber.” The rectal temperature is taken immediately after the bath, and again three quarters of an hour later. The patient often complains bitterly when in the bath, and shivering and blueness are almost a constant sequence. Food is usually given with a stimulant after the bath. The only contraindications are peritonitis and hemorrhage. Neither bronchitis nor pneumonia are so regarded. The good effects of the baths are: (1) the reduction of the fever; (2) the intellect becomes clearer, the stupor lessens, and the muscular twitches disappear; (3) a general tonic action on the nervous system and particularly on the heart; (4) insomnia is lessened, the patient usually falling asleep for two or three hours after each bath; and (5) most important of all, the mortality is, under this plan of treatment, reduced to a minimum. This *Brand method*, as it is called, has steadily advanced in favor both in hospital

and private practice, and in spite of the difficulties and the unpleasant features necessarily connected with it, there is no plan of treatment which gives such results. In the hospitals which carry out a strict hydrotherapy the death rate is about seven per cent, while in other institutions the death rate is from ten to fifteen per cent.

"The lukewarm bath, gradually cooled, may be used in private practice when the Brand method is not practicable. A bath at from 90° to 80° , and cooled down 10° or 12° by pouring cold water on the patient, will be found very satisfactory. When an insuperable objection to the bath exists, other hydrotherapeutic measures may be taken. The body may be sponged with tepid or cold water every time the temperature rises above 102.5° . If done thoroughly, taking limb by limb first, and then the trunk, occupying from twenty minutes to half an hour in the process, the rectal temperature may be reduced two, or even three degrees. In private practice, when the bath is not available, the cold pack is a good substitute. The patient is wrapped in a sheet wrung out of water at 60° or 65° , and cold water is sprinkled over him with an ordinary watering pot. This is very efficacious in cases with pronounced nervous symptoms."

If there is persistent constipation, the bowels should be moved every other day by means of a soap-and-water enema.

If hemorrhage occurs, keep the patient absolutely quiet, and give the indicated remedy. Apply ice-bags over the abdomen. It may be necessary to administer opium in appreciable doses, or morphine $\frac{1}{8}$ to $\frac{1}{4}$ gr. hypodermatically, to quiet peristalsis. Peristalsis acts as a mechanical irritant to the ulcer, and may be the sole cause of the hemorrhage. In such cases it is wonderful how quickly the latter is controlled by morphine, which can only be looked upon under such circumstances as a mechanical agent, and should be used without hesitation. If collapse follows, give stimulants freely.

When there is excessive tympanites, introduce a long rectal tube, and let the gas escape. Also change from a milk diet to peptonoids, meat juices or egg albumin.

If perforation occurs, and the patient reacts from the shock, an operation should be performed at once.

Therapeutics.—There is no disease in which the efficiency of homœotherapeutics is more signally displayed than in the treatment of typhoid fever, at the same time there is no disease where strict individualization is more necessary. The habit of considering one, or at most, two or three remedies as specifics, is entirely wrong. The habit also of interpolating antipyretics and other allopathic palliatives is to be condemned. To simply reduce temperature without

reaching the disease is of no benefit, except in so far as that may be accomplished by proper bathing and other simple local measures. Anders says that "while high temperature is an indication of danger in specific fevers, it is not always the cause of it," and later on he says that the most reliable antipyretics "(phenacetin, acetanilid and antipyrin) are open to the serious objection, that they depress cardiac power, and on account of this I do not use them in hospital practice (where the Brand method can be rapidly carried out), and very rarely indeed at any time in private practice."

Baptisia. — This is a drug often indicated at the onset of typhoid fever, but it is not a specific, and the habit of universally prescribing Baptisia in typhoid fever is wrong and can not be too severely condemned. At the same time I am fully convinced, after thirty years' experience, that when indicated and given promptly during the initial stage, Baptisia will abort the disease. I have seen it done too many times to believe otherwise. If given at first, during the stage of hyperemia, before ulceration of Peyer's glands has taken place, it dissipates the former and prevents the occurrence of the ulceration — microbes to the contrary notwithstanding. Dr. Kippax says: "Baptisia may be justly considered our sheet anchor in the treatment of typhoid fever during the first week. For it is capable of exciting a fever resembling that of typhoid, and of producing congestion and catarrhal inflammation of the intestinal mucous membrane, with abnormal tenderness and diarrhea, the pathological condition present during this period." But this pathological condition is not reached by Baptisia unless its individual symptoms are present. The chief indications are: Confusion of mind; muttering delirium; restlessness; dusky-red face; slight sensitiveness in right iliac region; tongue white, with red papillæ and red edges; yellow, offensive stools; weary, bruised feeling all over. In the second or third week of typhoid fever, Baptisia may be indicated when the patient is in a stupor; face besotted; sordes on lips and tongue; tongue dry and brown in center, edges red; stools thin, dark and very offensive; putrid breath, profound prostration. A clinical symptom that I have repeatedly verified is "she can not go to sleep, because she can not get herself together. Her head feels as if scattered about, and she tosses about the bed to get the pieces together." Also sensation as if there were a second self beside the patient in bed. Baptisia is usually employed in the tincture, but I have derived just as much benefit by using it in the first or second dilution. This is especially the case when Baptisia is indicated after the first week.

Bryonia. — This drug may be useful in any stage of the disease when indicated, but is more often required in the initial stage. The

clinical evidence of its value at this period is quite convincing. Dr. Ewardo Fornias, of Philadelphia, writes: "And I think that if any abortive power can be ascribed to any drug, Bryonia has it; its success will depend on its early application." Goodno and others employ it during the first week, unless there are clear indications for another medicine. Undoubtedly it is a safer remedy than Baptisia to employ in this manner. Its symptoms are: debility, languid feeling; loss of appetite, tongue coated white; weariness of the limbs, wandering sore pains in the muscles; dry, burning heat. Further on in the course of the disease it is indicated for delirium, if present; intense dry febrile heat, great thirst, dryness of the mouth; abdomen tympanitic and sensitive to pressure; dark-colored urine; shooting pains in the chest, *with cough*; hurried, labored respiration; apathy, drowsiness, subsultus tendinum. According to Dickinson it is better adapted to cases unattended by diarrhea. I prefer to use Bryonia in the third dilution, though it may act nicely in the higher potencies.

Gelsemium is often indicated at the onset of the disease when the patient, though nervous and irritable, is languid and listless and wishes to be let alone, with frequent but soft pulse, extreme prostration, vertigo, and usually more or less languid aching in the back and limbs. Sometimes the pains are severe and neuralgic in character and migrate from one place to another. The drug may be useful at any time in the course of the disease when so-called nervous symptoms predominate, though its indications must not be confounded with those of Hyos. It is best to use the first or second dilution.

Belladonna. — During the early stage, especially of cerebral cases; most apt to be indicated in children; great drowsiness, and an inability to go to sleep; frequent starting during sleep; violent delirium; headache; throbbing of the carotid and temporal arteries, and also in the forehead; burning heat and redness of the face; distortions of the mouth; dryness of nose, mouth and throat; tongue with red margin and white center; trembling and heaviness of the tongue, with stammering as if drunk; sore throat and dry cough from bronchial irritation. Third dilution or higher.

Rhus toxicodendron. — This drug is most often useful during the second and third weeks. Dickinson considers it the chief remedy in typhoid fever, and in his private practice has used it very extensively. This has also been the experience of many others, some of whom "rely wholly upon it except in extreme cases." Its symptoms are: mental operations slow and difficult; answers correctly but slowly, sometimes hasty; low muttering delirium; talks much to himself, or talks incoherently, without any seeming connection of ideas. Arndt says, "A pecul-

iar feature of the Rhus case is the evident consciousness on the part of the patient of the depression of the sensorium and of the reasoning powers, with seeming anxiety to cover this; eventually, however, the patient's thoughts become mixed, and he surrenders himself to the characteristic typhoid state." Bleeding from the nose; lips dry and covered with sordes; tongue red at the tip, in the shape of a triangle; tongue red, dry and cracked; bowels loose, worse at night, liquid stools, offensive, of the color of yellow ochre; involuntary alvine discharges during sleep, scanty urine; meteorism; subsultus tendinum, rose-colored eruption and miliary vesicles. There may be cough, with tough, bloody expectoration; bronchitis; pneumonic infiltration of the lower lobes of the lungs; severe rheumatic pains in the limbs, worse at rest; somewhat ameliorated by moving and changing position; constant restlessness; great exhaustion. Bæhr remarks that "cases adapted to Rhus never run a speedy course, nor will the crisis have to be expected previous to the seventeenth day; until then the medicine will have to be continued without fear, unless some other medicine should be indicated by particular symptoms." Third dilution or higher.

Phosphoric acid is often indicated during the fastigium, when there is complete apathy and indifference; don't want to talk; answers slowly and reluctantly; stupid sleep from which he may be roused, when he answers correctly, but soon falls asleep again; stupor; stupid and indifferent expression of the face; bleeding from the nose; meteoristic distention of the abdomen, with a great deal of rumbling and gurgling; stools which are gruel-like in consistence, frothy, yellowish or greenish in color, and ranging in frequency from three or four to fifteen or twenty daily; great debility; relaxed, pale skin; ecchymosis; bluish-red spots on the parts which the patient lies upon; decubitus; temperature of the body not high; constant, sticky, or profuse sweat; pulse weak and small, frequent and intermitting. Dickinson seldom prescribes Phos. ac. except when there is intestinal hemorrhage, the blood being dark and thick. I generally employ the second dilution though the third and higher may act well.

Arsenicum is rarely indicated, and according to my experience never useful until in the later stages of the disease, at a time and with symptoms of a most unpromising character. For this reason the drug is not usually attended with very brilliant results. Dickinson seldom uses it. Bæhr considers it the most prominent remedy. Goodno says, "It has been the most disappointing medicine I have prescribed in typhoid fever." Dr. Thos. Nichol, in Arndt's System of Medicine, says, "Arsenicum album is probably the chief remedy in true typhoid fever, and some practitioners, notably Fleischmann, of Vienna, treat

their cases with it exclusively. This, of course, is an error, but it is nevertheless true that it is called for in a greater number of cases than any other remedy, and that these cases are almost always of a grave character. In the most disheartening cases, cases which seem to be utterly hopeless, when the vital functions are in the grasp of a morbid poison of the most malignant kind, and the very lifeblood is profoundly and completely altered, *then* this great remedy is capable of saving life. But a mere indiscriminate giving of Arsenicum will not suffice. The case must be rigidly individualized, for China, Veratrum album, and Carbo vegetabilis all touch it very closely on several points of its domain." Its symptoms are profound prostration, great restlessness; picking of the bedclothes; sopor; face distorted, sunken, anxious, hippocratic; lower jaw hanging down; lips dry and cracked; lips, gums and teeth covered with sordes; tongue red and dry, cracked; black tongue; speech unintelligible, lisping, stammering, as if the tongue were too heavy; excessive thirst, but drinking little at a time; vomiting and retching; burning in the stomach and bowels, sensitive to pressure, meteoristic distention of the abdomen; constipation or looseness of the bowels; brownish or watery, bloody, foul involuntary discharges; involuntary discharge of urine or retention of urine. Voice weak and trembling. Rose-red spots on the chest and abdomen; petechiæ; decubitus; excessive prostration and rapid emaciation; pungent, hot, dry skin, like parchment; cold, clammy perspiration, pulse frequent, small, trembling, intermittent. A cadaverous smell scents the whole atmosphere. All symptoms worse about and soon after midnight or noon. The third to sixth trituration is usually employed.

Phosphorus may be indicated in an uncomplicated typhoid, but is mostly required where pneumonic complications are present. Bronchitis or pneumonia, dry cough, hurried respiration, tightness of the chest, even hepatization. There is great prostration; rose-colored spots; ecchymoses; vomiting of watery, bilious, and slimy masses with great pain; frequent, unpainful diarrhea, with meteorism and loud rumbling; the discharges are watery, greenish, grayish or black from decomposed blood; great weakness after each discharge. It is a valuable remedy if diarrhea continues after convalescence. Third dilution or higher.

Arnica is frequently an invaluable remedy in the second and third week of typhoid. Its chief indications are an indifferent, stupid condition, the patient falling asleep when answering a question; feels sore and bruised; the bed seems too hard; the head is hotter than the body; suggillations; petechiæ; intestinal hemorrhage; involuntary stools; also when bedsores form. The symptom, "trembling of the lower lip," I have frequently verified. I rarely use Arnica in typhoid fever below the thirtieth potency.

Hyoscyamus is of exceeding great value in nervous forms of typhoid. Great nervousness, carphologia; low, muttering delirium; sleeplessness; involuntary evacuations; tongue red or brown, dry and cracked; paralyzed; loss of speech, or indistinct speech; cadaverous smell from the mouth; convulsive motions; grating of teeth; jerkings; subsultus tendinum; trembling; sleeplessness, or constant sleep with muttering; coma vigil. Roseola spots on chest and abdomen; cold extremities.

I use Hyoscyamus from the third to the thirtieth potency, the latter often acting best.

According to Goodno, "When the patient is in a frenzy of excitement, sleepless, face haggard, pulse failing, *hyoscine hydrobromate* (3x trituration), one grain every hour, seldom fails within six or eight hours to bring quiet and a refreshing sleep. The remedy should not be discontinued as soon as relief is secured, but continued at from four- to six-hour intervals as long as the course of the case is favorable, as it exercises a most favorable influence upon the fever and the general disease."

Carbo vegetabilis (30x). — "Often at the brink of death a savior, in those states of collapse, dissolution of blood, and paralytic conditions, which seem rapidly to invade the whole organism. All this is indicated by stupor, out of which the patient can scarcely be roused for moments; the eyes are dull, without luster, and the pupils without reaction against light; the hearing is gone; the face is pale, sunken, hippocratic, cold; there are hemorrhages from mouth and nose; the tongue is sometimes moist and sticky; other times parched and cracked, heavy, scarcely movable, bluish or pale; the pit of the stomach is bloated; the abdomen meteoristic, with loud rumbling and gurgling of wind in the intestines; there is colliquative diarrhea, brownish, grayish or bloody, of a cadaverous smell, and involuntary. The cough has ceased, and the collecting secretions cause loud, rattling breathing, a sign of beginning paralysis of the lungs; the circulation is without energy; the blood stagnates in the capillaries, and causes cyanotic blueness of face, lips and tongue; ecchymotic spots here and there; decubitus; the pulse is extremely weak, frequent and small, scarcely perceptible; face and extremities grow cold and become covered with cold perspiration — all signs of beginning paralysis of the heart; in short, the patient offers a picture of complete torpor of all vital functions, thus differing entirely from that of Arsenicum, which is always more or less associated with erethism of the system." (Raue.)

Cinchona is not often useful during the course of the disease, but when there is retarded convalescence following hemorrhages, with weak

appetite and digestion, and evacuations of imperfectly digested food, this drug is required. I prefer to use the first or second dilution.

Lachesis (6. to 30x) is frequently called for in severe types of the disease where there is a tendency to blood decomposition and with the peculiar nervous phenomena of the drug. There is loss of consciousness; muttering delirium; stupor; dropping of lower jaw; dry, red or black tongue, cracked on the tip and bleeding; in the attempt of protruding it, it trembles; or the tip remains under the lower teeth, and does not come out; dry lips, cracked and bleeding; stools very offensive; hemorrhage from bowels, with flakes of decomposed blood, having the form and appearance of charred straw, always worse after waking from sleep.

Muriatic acid (1x).—Hughes ranks this drug with Arsenicum as *the* remedy against the essential lesion of typhoid. Low types of the disease; when putridity threatens or is already present; weakness almost to general paresis; stupor; unconscious; lower jaw hangs down; slides down in bed; sordes on the teeth; involuntary discharges. The diarrheic stools are frequent, foul and scanty, often blood-streaked, sometimes accompanied by hemorrhage, and the discharges are mingled with shreds of intestinal mucous membrane and fragments of whitish mucus.

Nitric acid (3x to 6x).—An invaluable remedy in the hemorrhage of typhoid. Offensive, purulent, bloody stools; ulceration; tongue smooth, glossy and deep red, sometimes fissured and the buccal mucous membrane raw and ulcerated; great prostration; intermittent pulse; sometimes threatened paralysis of the lungs.

Nux vom. (3x to 30x) is often useful for the gastric disturbances of the first week. Vertigo, dull headache, tongue coated white, bad taste in the mouth, thirst with aversion to water, great sensitiveness, constipation. Other characteristic symptoms of the drug are often present.

Opium (30x).—Stupor, can scarcely be aroused; speechless; eyes half open; mild delirium or loud talking, fury, singing, desire to escape; the darker red the face, the more it is indicated; impending cerebral paralysis from profound congestion.

Sulphur (30x) is frequently called for in tedious cases where the system does not respond well to remedies, for the purpose of arousing the reactive energies of the system. In such cases the characteristic systems of sulphur are often manifest.

Sulph. acid.—Great prostration, hemorrhages, drowsiness, vomiting, sour discharges. Purpura. I use the tincture—ten drops to half a glass of water, in teaspoonful doses.

Terebinthina. (1X). — This drug is often of great value in cases where the tympanites is marked, and especially where there are intestinal hemorrhages; bloody urine; red glossy tongue; purpura; bedsores. Consult also remedies for intestinal hemorrhages.

TYPHUS FEVER.

Synonyms. — Typhus Exanthematicus, Petechial Fever, Pestilential or Putrid Fever, Ship Fever, Jail Fever, Camp Fever.

Definition. — An acute, highly contagious fever, occurring epidemically, and characterized by an acute onset, a petechial eruption, typhoid symptoms, and a termination by crisis about the fourteenth day.

Pathology. — There are no lesions characteristic of this disease. The petechial eruption remains after death, which is in contrast with that of typhoid which disappears. The blood is profoundly altered, dark, thin, with lessened fibrin; tissues dark, soft and flabby, and often large ecchymoses are observed after death on the dependent parts of the body. Enlargement and parenchymatous degeneration of the spleen and liver are found. The heart muscle and all other tissues may show granular degeneration, due to the high temperature.

Etiology. — The specific germ of typhus fever has never been isolated, but is presumed to exist. The disease is most prevalent in Ireland, also in England and Russia. It is rarely seen in the United States except in seaports, where it is brought by emigrants, a few cases occurring every year in New York and Philadelphia. The immediate predisposing cause of the disease is unsanitary surroundings. Overcrowding, filth, poverty and famine are invariably its forerunners. It always occurs as an epidemic. These are apt to follow wars and famines. It is said to prevail more in winter than summer, for the reason that during the cold weather the homes of the lower classes are not so well ventilated and are also less cleanly. The disease is one of the most highly contagious known. What the contagium bearer is has not been definitely ascertained. It is not especially the alvine discharges as in typhoid. No age is exempt, but the majority of cases occur between the fifteenth and thirtieth years, probably because young people are more liable to exposure to the virus.

Symptoms. — The period of *incubation* is from nine to twelve days, though it may be much less. There are seldom any prodromes, though an attack may be preceded for a few days by frontal headache and malaise.

The *onset* is abrupt, the initial symptoms being a severe chill or series of chills, followed by vertigo, tinnitus, severe headache.

muscular pains, profound prostration and fever. The temperature rises rapidly, reaching 104° to 105° F. within a day or two. The pulse is at first full and strong, but soon weakens and becomes frequent, 120 and more. The fever is of a continuous type, there being no remissions during the first week. Very characteristic are the red congested conjunctiva, the dusky face and dull expression, and the low, muttering delirium. The tongue is early coated, and becomes rapidly dry and brown, with sordes on the teeth and gums. The bowels are constipated. The urine is scanty, of increased specific gravity, and may contain albumin.

From the third to the fifth day the characteristic eruption appears. It may appear as early as the second and as late as the seventh day. Its appearance does not mark any decline in the temperature, or abatement of other symptoms. It first appears on the trunk, chest and abdomen, and then spreads all over the body, usually excepting the face. At first the eruption consists in slightly elevated dirty-pink spots, which partly disappear on pressure, but after several days they become petechial, hemorrhagic, and more permanent, remaining after pressure; there is also a peculiar dark mottling of the skin, an alternation of purple blotches with others of a light hue. The whole appearance gives a spotted effect, hence one of the names given the disease, spotted fever. In children the eruption resembles that of measles, and from the mottled appearance given by it to the skin the eruption has been termed the *mulberry* rash. With the appearance of the eruption the general symptoms become more intensified. By the seventh or eighth day or even earlier the temperature may reach 106° F. or even higher, but there are morning remissions. Hyperpyrexia may be present in bad cases, the temperature reaching as high as 109° F., which is the so-called *calor mordax*, and heralds a fatal termination. The pulse is rapid, 120 to 140 or more, and is feeble, possibly irregular and often dicrotic. The respiration often runs from 40 to 60 per minute. The general symptoms deepen. The tongue becomes dry, brown or even black, and fissured, trembles when protruded or catches behind the teeth. Sordes collects on the teeth and lips. Stupor becomes more profound even to complete coma or there may be *coma vigil*, in which the eyes are wide open, but the patient is unconscious. Tremors, subsultus tendinum and carphologia are common symptoms. The prostration becomes extreme, and death may occur from exhaustion.

In favorable cases a crisis occurs at about the end of the second week. The temperature falls rapidly to normal, and all the symptoms quickly improve. The patient usually falls into a restful sleep, and awakens with a clear head. The other symptoms soon disappear, and

the strength returns rapidly. In some cases convalescence is slower, there being slight irregularities of temperature or fresh exacerbations, but relapses rarely occur.

Complications.—There is always hypostatic congestion of the lungs, and along with this a good deal of bronchial catarrh and cough. There may be broncho-pneumonia, which may terminate in gangrene of the lungs. In bad cases where the patient survives until the third week, death usually results from a complicating pneumonia, which is sometimes lobar in character. Meningitis is a rare complication, and is always fatal. Suppurative parotitis is not uncommon. Thrombosis of large veins or of cerebral sinuses may occur. Bedsores are common, and there may even be gangrene of the extremities. Gangrene of the fingers and toes has been observed to follow the disease.

Neuritis followed by paralysis is the most important of the possible sequelæ.

Diagnosis.—The known presence of an epidemic, the unsanitary surroundings and the characteristic course and symptoms of the disease make the diagnosis usually an easy matter.

It is distinguished from typhoid fever by the sudden onset, the absence of the characteristic tidal wave temperature, the character of the eruption, the rapid course and the termination by crisis.

In malignant measles the eruption appears first on the face, and the acute coryza is not present in typhus. In cerebro-spinal meningitis there is retraction of the head, more pronounced cerebral symptoms, even convulsions and less prostration. The petechial character of the eruption is not present.

Prognosis.—Typhus fever occurs both in a mild and in a malignant type. In the former the prognosis is favorable. In the latter unfavorable, especially in those of advanced years, death often occurring before the appearance of the eruption. Young subjects usually recover. Complicating conditions greatly affect the prognosis. The mortality of the disease at the present day is remarkably light as compared with the past, owing to the generally improved sanitary conditions now existing. At present the mortality is from 10 to 20 per cent.

Treatment.—*Prophylactic.*—Thorough disinfection and absolute isolation are indispensable. The rules for the former given under typhoid fever apply here. Plenty of fresh air is important, not only as a prophylactic, but also in the treatment of the disease.

The *general management* of the case does not differ materially from that of typhoid fever. The treatment in tents in the open air has given greatest satisfaction, even in winter, the patient being pro-

tected in winter by extra bedding. The patient should be given plenty of fresh water. Hydrotherapeutic measures to control the temperature are especially valuable in typhus. According to most authors, stimulants are required in almost all cases. The disease is self-limited, and therefore any measures that will temporarily control the temperature and combat exhaustion until the disease has run its course, are particularly indicated. Antipyretics are, however, strongly contraindicated.

Baptisia is the chief remedy during the first stage, and is usually well indicated. During the second week Arsenic, Rhus, Lachesis, Hyos., Phos. acid, Stram., Muriatic acid, Phosphorus and Opium are oftenest required. The severe headache, and sometimes the delirium, may call for Bell. For the delirium and nervous phenomena Hyos. or Stram., or in severe cases Hyoscine hydrobromate are most efficient. The indications are essentially the same as already given for typhoid fever. The dose of each remedy is the same as in typhoid.

RELAPSING FEVER.

Synonyms.—Febris Recurrens, Relapsing Typhus, Famine Fever, Seven-day Fever.

Definition.—An acute infectious, contagious disease, caused by the spirillum of Obermeier, and characterized by a short paroxysm of fever, ending in crisis, followed by a well-marked remission, and that by a relapse on or about the fourteenth day.

Pathology.—There are no characteristic lesions of the disease. Such as are present correspond with those of typhus. Enlargement of the spleen is most conspicuous. If death occurs during the febrile period, there are found parenchymatous changes in the liver, kidneys and heart. There may be internal hemorrhages. The tissues may be jaundiced.

Etiology.—The specific cause is infection by a spirillum or spirochete, first described in 1873 by Obermeier. They are present in the blood only during the pyrexial period. After death they are found in all the organs. The disease occurs only in epidemics, and, as in typhus fever, its spread is due to overcrowding, filth and destitution. It is highly contagious. One attack does not immune from subsequent attacks.

Symptoms.—The period of incubation usually ranges from five to seven days, but an attack may develop a few hours after exposure. There may be prodromal symptoms—malaise, shooting pains, etc., but as a rule, the invasion is abrupt and without previous warning. The disease is ushered in with a severe chill, followed by

violent fever, intense pain in the head, back and limbs, with dizziness. The temperature rises rapidly, soon reaching 104° to 105° F. The patient is at once very sick and greatly prostrated, requiring him to take to his bed immediately. There may be nausea and vomiting, and in some cases vomiting of blood. Even convulsions may occur in young subjects. The pulse rises rapidly to from 110 to 140 or higher, and is full and bounding, but later, in severe cases, becomes weak and irregular, and even intermittent, and at the same time the heart sounds become more feeble and indistinct. The tongue usually remains moist and while the patient may be delirious, typhoid symptoms are not pronounced, except in very severe cases.

The skin is dry and soon assumes a dirty-yellow color, or has a distinctly bronze appearance. There is no characteristic eruption, but in some cases there appears on about the fifth day a coarse, red diffused, measly eruption, with a mottling of the skin all over the body, except the face, disappearing on pressure. The face has a uniform deep, dusky flush, the skin has a glazed appearance, the pupils contracted, the eyes injected. Herpes may be present. The liver and spleen are regularly enlarged and tender. There is occasionally abdominal tenderness in the epigastric or iliac region, but there are no active intestinal symptoms. There is often considerable cutaneous hyperesthesia and muscular soreness, and sometimes tremor and subsultus. After five or six days, rarely as late as the tenth day, the crisis occurs. The fever unabated, may even show hyperpyrexia, when with a suddenness equal to that of the invasion, the temperature falls rapidly to or below normal, there is a profuse sweat, the various symptoms rapidly disappear, and in the course of twelve hours the patient pronounces himself well. This abrupt crisis is always a time of danger. The critical sweat may be replaced by an exhausting diarrhea, intestinal hemorrhage, metrorrhagia or epistaxis, and result in collapse, from which, however, the patient usually rallies.

The disease may terminate with the first crisis, but in a majority of cases after an interval of about seven days there will be a recurrence of the chill and pyrexial paroxysm, which is again succeeded by a crisis. This may occur two or three times, rarely is the pyretic stage repeated four or five times. Each succeeding attack is shorter and lighter than the preceding one. Convalescence is apt to be slow and tedious, especially if there has been a series of relapses.

Complications.—These are not frequent. There may be hypostatic congestion of the lungs, broncho-pneumonia, laryngitis, or edema of the glottis. Nephritis and hematuria are of rare occurrence. Rupture of the spleen sometimes takes place. Pregnant women

usually abort. Post-febrile paralysis may occur. Cardiac failure is an occasional termination and ophthalmia sometimes leading to total blindness may occur.

Diagnosis. — In the first stage relapsing fever greatly resembles typhus, but there is less adynamia, the crisis does not occur so easily in typhus, there is no repetition of the fever stage after a definite interval, and the characteristic discoloration of the skin is absent. Yellow fever has a shorter febrile stage, the remission not so complete, the vomiting is late and characteristic, the spleen is normal, and the yellow color appears later in the course of the disease. Remittent fever begins with a decided chill, followed by fever and sweats, and not the continuous high temperature till the fifth or seventh day.

“To be able to state that relapsing fever is positively present the *spirocheta Obermeieri* must be found in the blood, and this is particularly true in the earlier cases of an epidemic, before they have passed through their typical relapses. To demonstrate the presence of this parasite in the blood during the fever stage is not a difficult task. A drop of blood obtained from the finger tip is to be examined microscopically without previous dilution. On account of their size and motility the spirilla can be readily detected, and usually the attention of the examiner is first arrested by the peculiar joggling movements of the red blood corpuscles. Then the real disturbing agents appear as slender spirals with a snake-like motion. Their identity may be confirmed by staining with anilin colors, and, in exceptional cases, by injecting them into the blood of the monkey, in whom they produce the disease.” (Anders.)

Prognosis. — The prognosis is good. A certain class of cases known as “bilious typhoid” in which the usual symptoms are greatly intensified, is frequently fatal. The occurrence of any of the various complications may change the prognosis. The most frequent causes of death are probably pneumonia and acute hemorrhagic nephritis. The disease is more fatal in old people.

Treatment. — The general management of the case is exactly the same as for typhus, with the exception that during the afebrile stage a more liberal diet may be allowed.

Therapeutics. — According to reports from those who have had experience in the epidemics of relapsing fever, there can be no doubt but that homœopathic remedies will modify the febrile paroxysms, and favorably influence the course of the disease. At the onset *Verat. vir.*, *Acon.*, *Gels.*, *Bell.* and sometimes *Bryonia* may be required. Later the symptoms may demand *Bry.*, *Rhus tox.*, *Baptisia*, *Ars.*, *Eupat.* or *Cimic.* The low dilutions are preferable. Quinine is useless,

MALARIAL FEVER.

Synonyms. — Ague, Fever and Ague, Chills and Fever, Marsh Fever, Swamp Fever, Paludal Fever.

Definition. — An infectious, non-contagious fever, caused by the *plasmodium malariae*, and characterized by periodicity, enlargement of the spleen and a tendency to extreme anemia.

Varieties. — There are five distinct clinical subvarieties: (1) Intermittent fever; (2) Pernicious intermittent fever; (3) Remittent fever; (4) Pernicious remittent fever; (5) Malarial cachexia. To these may be added: (6) Masked intermittent; and (7) Malarial hematuria.

Pathology. — The chief lesions, and those which are constant to all forms of malarial fever, are presumed to result directly from the effect of the malarial micro-organisms upon the blood. Anemia results from the destruction of red corpuscles, in protracted cases the blood often resembling that of pernicious anemia. The leukocytes are almost invariably diminished. Pigment deposits are abundant, both free in the blood and in certain organs, more particularly the spleen and liver. In severe cases all the organs are pigmented grayish-brown or even black. This pigment is due to the conversion of the hemoglobin of the blood into melanin by the malarial parasites. The latter also "engenders a toxin which may be in part responsible for the morbid lesions of the disease." (Anders.)

The spleen is congested, swollen and softened. In protracted cases it becomes large and hard (ague cake). In rare cases the spleen may rupture, causing fatal hemorrhage. Hemorrhagic infarcts are sometimes present. The liver is also congested and swollen, but not to the same extent as the spleen.

Etiology. — The *plasmodium malariae* was discovered by Laveran in 1880. It is presumed to be the specific cause of malaria, as it is found associated with the disease in all its forms, and is at least of great diagnostic value. It is not a bacterium, but is a form of protozoon or hematozoon. Anders describes three varieties, corresponding with the three leading clinical forms of malarial fevers: (1) *The Ameba causing Tertian Intermittent Fever*; (2) *The Ameba causing Quartan Fever*; (3) *The Ameba causing Estivo-autumnal Fevers*.

"The evolution of two of these parasites at least takes place within the red blood corpuscles. They enter the red cells in the form of small, non-pigmented plasmodia, exhibiting ameboid motion, and then feed upon their host, transforming, at the same time, the hemoglobin of the latter into dark pigment granules as they develop. When the intraglobular plasmodia have consumed the red blood corpuscles,

the granules of pigment accumulate in the center of the parasite, while on its periphery the processes of subdivision and sporulation are taking place, forming fresh generations of hematozoa. These young parasites assume the form of minute, more or less spheric, hyaline bodies, which again enter the red blood corpuscles, and start on a new cycle of development."

(1) *The Ameba Causing Tertian Intermittent Fever.* — These "parasites are exceedingly numerous in the blood, and pass through the various stages of their life cycle almost simultaneously, the sporulation of an entire generation occurring within the space of a few hours. (Golgi.) The occurrence of the malarial paroxysm follows the process of sporulation, which is attended, most probably, with the development of a *toxin*, and the symptoms of the disease may be attributable chiefly to the effects of the latter. The red corpuscle that includes the parasite becomes enlarged and decolorized as the latter develops. The parasite of tertian intermittent runs its cycle in about forty-eight hours. Hence, infection by a single generation would result in sporulation every second day, followed by the malarial paroxysm. Quite commonly, infection by two groups of parasites occurs on successive days, and, since each has a definite period of evolution, a daily malarial paroxysm is the result (quotidian intermittent). Multiple infection with this parasite may occur, but with great rarity."

(2) *The Ameba Causing Quartan Fever.* — This parasite "sporulates about seventy-two hours after it enters the red corpuscle; hence, if only one group of parasites be present, febrile attacks occur every fourth day, forming the simple quartan intermittent. On the other hand, double quartan infection results in paroxysms on two successive days, followed by an intermission lasting one day, while triple infection, or the presence of three groups, causes daily paroxysms—the quotidian intermittent. Infection by more than three groups of the quartan parasite may occur, but is very rare.

(3) *The Ameba Causing Estivo-Autumnal Fevers.* — "The time occupied by the life cycle of this parasite is still an unsettled question, but it is generally believed to vary between the extremes of twenty-four and forty-eight hours. In one of my own cases the febrile paroxysms recurred every seventy-two hours. For the difference in the period of evolution there is no satisfactory explanation, though the variation may be connected with the circumstance that it frequently (though by accident) penetrates into the red blood corpuscle."

In addition to the above ciliæ or flagellate bodies are found, and grow from the varieties already named. They are usually found in the blood of the spleen, but have no definite relation to any clinical form,

The exact mode of infection — how the parasite enters or leaves the body—has until quite recently, at least, been unknown, but was supposed to have been by inhaling malarial air, and, perhaps, to a less extent by drinking malarial water. It has for a long time been definitely known that the disease could be induced by injecting the blood of a malarial subject into that of a healthy one, and also that the disease was not contagious, and, therefore, that after the parasite had once entered the system, it did not escape into and infect the surrounding atmosphere. These facts, together with the peculiar conditions favoring infection (see below), led to investigations by Koch, and experiments conducted in Italy, Java and New Guinea, and further demonstrations by Ross, which seem to prove that not only is the home of the parasite in the human body, but also that the mosquito is the agent or intermediate host, by which the organism is conveyed from the blood of one human being to that of another. So far only one species of the mosquito—those of the genus *anopheles*, have been shown to have the power to act as carriers of the malarial parasite.

In order to convey malarial infection the *anopheles* must feed upon the blood of a person already affected with the disease. In so doing the insect, with the ingested blood which it withdraws, also takes in a number of sexually mature malarial parasites. In the middle intestine of the mosquito the parasites undergo the usual development. Pigmentation, segmentation and sporulation take place, and the sporules lodge and accumulate in the insect's salivary gland. When in this state, the mosquito is in a condition to infect the human subject. When it "stings," it injects beneath the victim's skin the sporule-laden salivary secretion. The sporules are absorbed into the blood, there they undergo development, and there is a new case of "malarial fever."

This is the mode of infection of malaria now pretty generally accepted, though there are many who doubt the verity of this discovery, and are not yet ready to accept the theory without still further demonstration of its truth. It seems quite probable, however, as Gatchell says, that "the mosquito is the intermediate host of the malarial parasite, and is the active agent—and probably the sole agent—in conveying the infection from the sick to the well. As the rat is the intermediate host of bubonic fever, so is the mosquito—genus *anopheles*—of malarial fever."

At all events the following facts have been established :—

(a) Every phase of the development of the malarial parasite has been demonstrated to take place in the body of the mosquito.

(b) Mosquitoes known to be free from the malarial organism have been made to take blood from patients suffering from malaria, and,

after the lapse of the proper time for the completion of the cycle of changes in the anopheles, healthy subjects stung by the infected insect have developed malaria of the same type as that from which the blood was originally drawn.

(c) Persons from a distance known to be free from malarial infection have, experimentally, taken up their residence in one of the most active malarial regions of the Roman campagna, and, while so residing, by means of screens and bars, have protected themselves absolutely from the bites of mosquitoes. Although eating the same food, drinking the same water and breathing the same air as others, they have remained free from malarial infection, while the inhabitants about them suffered almost universally.

(d) Mosquitoes have been sent from a malarial district to localities a thousand miles distant, where a case of malaria was never known. Healthy persons in the new locality developed malaria on being stung by the imported insects.

Conditions Favoring Infection.— The following conditions favoring the development of malaria have long been recognized, but it may be very readily observed that these also are precisely the conditions that favor the breeding of mosquitoes. Malaria and mosquitoes require the same conditions for their development. They thrive together, and where the one is found, the other is almost certain to be present. It is, therefore, not unreasonable to presume a positive etiological relation between the two. Low temperatures (below 60° F.) destroy the malarial virus. High temperatures are necessary for its active development, though an excessively high temperature may arrest the development. The disease is, therefore, most prevalent in tropical and subtropical climates and during the hot seasons in temperate climates. In the temperate zones it is most common as we near the tropics, being, in this country, more prevalent in the Southern than in the Northern States. The influence of moisture as an etiological factor is not understood, but certainly a moist atmosphere is more conducive to the disease than a dry atmosphere. High temperature, moisture and decomposing vegetable matter are certainly most favorable conditions for the development of malaria. For this reason it is most apt to occur late in hot seasons in temperate climates, after the heat and moisture have induced vegetable decomposition. For this reason also the disease is most common near low river banks frequently covered and uncovered with water and exposed to the sun. Largely also for the same reason malaria does not thrive in a high altitude, and is most prevalent and severe in very low altitudes. The soil is considered as the natural breeding place of malaria. A freshly upturned soil

or damp, poorly drained soil when exposed to the sun favors malaria. Marshes are a frequent breeding place, and are highly malarious. This is especially true of swamps that are occasionally overflowed, and afterward subjected to the rays of a hot sun, with consequent vegetable decomposition. Fresh-water marshes, especially if stagnant or if tainted with salt water, favor the development of malaria. The more luxuriant the vegetation in the localities above mentioned, the greater the development of the poison. The foregoing facts explain why it is that localities once pronouncedly malarial, after having been drained and cultivated, are freed from its poisonous influences. Malaria may originate over a sandy soil, and even rocky beds and scanty vegetation, but never without high temperature. High winds may carry the miasma to localities in which it is not engendered, but they are destructive to malarial influences by hastening evaporation and drying the soil. The latter effect is also produced by rapidly growing trees which extract large amounts of water from the surrounding soil. The planting of the eucalyptus tree in certain districts has had the effect of almost entirely freeing those localities from malaria. How much of this effect may have been due to the well-known medicinal virtues of the eucalyptus cannot be estimated. The poison does not rise high above the earth's surface. Those in malarious districts who live in upper stories or on elevated places are affected less than those who live lower down. All ages are susceptible, but adults are more often exposed to the miasm. The disease is more common in men because of their increased exposure. Strangers are more frequently affected than natives. Negroes are less susceptible than whites.

I. Intermittent Fever.

This is the variety of malarial fever commonly known as ague, or chills and fever. It is preceded by a period of incubation usually of from one to two weeks, but may be only twenty-four hours, or on the other hand, several weeks or even months may elapse after exposure before the symptoms are manifest.

Symptoms.—These occur in paroxysms, which, in typical cases consist of three distinct stages—chill, fever and sweat, or the cold stage, the hot stage and the sweating stage. The paroxysms may or may not be preceded by headache, nausea, languor, yawning and a yellowish complexion. In most cases the onset is abrupt.

The *cold stage* usually begins gradually. At first, slight cold, creeping sensations growing more severe until the chill becomes intense, causing the teeth to chatter and the body to shake with more or less violence. The skin is cold, though the internal temperature is raised

often as high as 105° to 106° F. The patient looks cold, the face is pale and pinched, and the lips blue, as are also the finger and toe nails. There may be nausea or vomiting and severe headache. The pulse is rapid. The urine is increased in quantity. This stage lasts for from half an hour to two hours.

The *hot stage* succeeds the chill. The skin becomes hot and dry, and the face flushed. The temperature, if not already up to 104° to 106° F. soon rises to that point. The pulse is full and bounding. There may be acute dilatation of the heart, in which case the pulse is feeble and often irregular. There is intense thirst, dry mouth, throbbing headache, coated tongue and foul breath, and sometimes vomiting. Often there are severe pains in the back and in the bones. The spleen is enlarged and tender on palpation. This stage lasts from three to six hours, the fever toward the last gradually declining. During the hot stage the plasmodium may be found in the blood.

The *sweating stage* follows the fever. There first appear drops of sweat on the face, which soon become a profuse sweat all over the body. With it the symptoms are promptly relieved, and the patient experiences a sensation of great comfort. The temperature soon falls to normal, and frequently to subnormal. The headache may persist for hours after the paroxysm.

In typical cases the paroxysms occur with great regularity, but the length of the interval between the paroxysms varies in different cases, giving rise to certain designated types. The interval is most frequently twenty-four hours (the quotidian type); about as frequently it is forty-eight hours (the tertian type); less frequently it is seventy-two hours (the quartan type). If there are two paroxysms within twenty-four hours, it is designated as "double quotidian." In "double tertian" severe paroxysms occur every third day, with mild paroxysms on the intervening days. "Of the above types, as stated in the life history of the parasite, two only—the *tertian* and the *quartan*—have been clearly distinguished. The quotidian ague (the most frequent clinical variety) is generally due to double infection by the tertian parasite, and very rarely is it to be attributed to the presence in the blood of three groups of the quartan parasite, resulting in daily sporulation." (Anders.)

Following the paroxysm there is often and almost invariably in old cases of a yellowish-brown discoloration of the skin usually termed the malarial complexion, and is always present when a "malarial cachexia" has developed. Fever blisters (herpes) are of common occurrence.

The severity of the paroxysms vary both as a whole and as regards the different stages, in a typical case. The chill may be mild. In

some cases, especially in the old residents of a malarious district the chill is entirely absent, constituting what is known as "dumb ague." The fever stage usually shows little variation. The sweating stage may be very light, and is usually in proportion to the severity of the chill. In some cases it is also absent. In children there is no shaking chill, and often the paroxysm is ushered in with a convulsion. In long-protracted cases the paroxysms become irregular and erratic as to both periodicity and severity.

Diagnosis. — In a typical case of intermittent fever there is little trouble in making a correct diagnosis. In typical cases there may be a resemblance to the hectic fever of tuberculosis or that accompanying septic and pyemic conditions and ulcerative endocarditis. In all these, however, there should be a history that would set the diagnosis at rest. In irregular forms of intermittents where the diagnosis is not clear, it may be necessary to make a microscopical examination of the blood for the malarial parasite, which when found removes all question of doubt.

Prognosis. — Intermittent fever offers a good prognosis in all cases when properly treated. Some cases which have either received no treatment or too much of the wrong treatment may become chronic, and develop the malarial cachexia. In highly malarious districts where the residents are constantly exposed it is often impossible with any treatment to prevent such a result. It should also be borne in mind that a simple intermittent sometimes precedes the pernicious form.

2. Pernicious Intermittent Fever.

This is a form of malarial fever of great gravity. It occurs only in highly malarious districts, and is rarely seen in temperate climates. In the United States it occurs only in the Southern States, except as cases are imported to the Northern States from the South or from Panama. It is sometimes called "Panama Fever." The paroxysms rarely recur with distinct regularity. The first attack usually presents only the characteristics of an ordinary paroxysm of intermittent fever, but subsequent attacks manifest a pernicious character. The disease presents several types, only three of which are of sufficiently frequent occurrence to merit description : —

(1) *The Algid Type.* — This form is more commonly known as *congestive chills*. It is characterized by nausea and vomiting, and there may be purging resembling that of cholera, and the patient may pass blood from the bowel, sometimes with true dysenteric symptoms. There may or may not be a chill, but the patient is cold, though the internal temperature is high. The patient passes into a state of great prostration and collapse, the symptoms closely resembling those of the collapse

of cholera. In some cases there is jaundice. This is the most common form of pernicious intermittent as seen in the United States. This variety is highly fatal.

(2) The *Comatosé* type usually begins with a severe chill, but the chill may be absent. A state of sudden, profound coma or of acute delirium soon succeeds the chill. A very high temperature is soon manifest. The skin is excessively hot and dry and the eyes bloodshot. The cerebral symptoms may disappear with the sweating stage or last for several hours longer. Many cases prove fatal at the first paroxysm. If they recover, they are quite apt to die in the next paroxysm. This "variety is due to an inordinate localization of the malarial parasites in the brain, where they form complete thrombi, and induce, as a consequence, pathologic lesions in the adjacent structures." (Anders.)

(3) *Hematuric Pernicious Malaria*.—In this form there is a severe chill. During the hot stage, and more particularly during the sweating stage, there is a disposition to hemorrhages. The urine is scanty and bloody, and there may be hemorrhages from any of the free mucous membranes or under the skin. Suppression of the urine and uremia may ensue. There is great prostration, labored respiration and sometimes cardiac failure.

Diagnosis.—Pernicious intermittent fever in its various forms may simulate typhoid fever or yellow fever. The characteristic temperature curve and other distinctive features of a true typhoid fever are not present. The possible combination of a typhoid and malarial poison in one system must not be overlooked. Yellow fever occurs as an epidemic, and has also its distinctive features. In case of doubt the blood should be examined for the plasmodia.

Prognosis.—The prognosis is very grave. Primary cases usually recover, but recurrences are highly dangerous, and very often fatal.

3. Remittent Fever.

Synonyms.—Continued Malarial Fever, Estivo-autumnal Fever. On account of the intensity of the gastro-intestinal symptoms it is also sometimes termed bilious remittent fever.

In remittent fever there are marked fever remissions, but the temperature never at any time becomes normal. It is a severer type of malarial disease than intermittent fever. It occurs mostly in the late summer and in the autumn, and is found chiefly in the Southern States of this country, in Italy, and in tropical countries. Mild forms of the disease appear in the Northern States. The Estivo-autumnal parasites previously mentioned are found in this disease.

Symptoms.—The onset may be abrupt but in most cases it is preceded by malaise, violent headache, coated tongue, and often by decided nausea. In some cases vomiting of bile is a conspicuous symptom. An attack of remittent fever may follow that of an intermittent fever. The onset is usually marked by a chill which may be moderately severe, but never so violent as in typical intermittents. The temperature rises rapidly, and once begun continues with remissions. In mild cases it runs from 101° to 103° F., and in severe cases from 103° to 106° F. The pulse is full and may reach from 100 to 120. There is a bursting headache, and often nausea and vomiting. In some instances there may be delirium or coma. The spleen is enlarged. The urine is high-colored, with high specific gravity, depositing a copious sediment of urates, and sometimes contains biliary coloring matter. It may also contain blood corpuscles or hemoglobin. *Herpes labialis* is quite common. The remissions usually occur in the early morning, and they are often accompanied by sweating, following which the headache and gastric symptoms are greatly relieved. The temperature usually falls from two to three degrees, and begins to rise again about noon, the headache and gastric symptoms being renewed. As the disease goes on, the temperature becomes more continuous, although in milder cases the remissions may still be decided. As the disease subsides, the febrile paroxysms grow milder and shorter, and the remissions more marked until an intermittent type of fever is present. The latter may remain and cause difficulty for some time, or rapidly disappear, and the patient is convalescent. Mild cases usually run from one to two weeks, but severe and badly treated cases may be prolonged to three or four weeks or longer. In bad cases the febrile paroxysms grow more intense, last longer, and there is a corresponding brevity in the remissions. Typhoid symptoms may supervene, and death result from asthenia.

In atypical cases there may be a febrile paroxysm every other day, lasting twenty or more hours. Sometimes the paroxysms "anticipate," that is, begin earlier each time, thus giving brief remissions, and presenting more or less consequent irregularity. Some cases may be hemorrhagic, bleeding from the kidneys and intestines being most common, the latter often leading to a diagnosis of typhoid fever. These cases are liable to be in connection with what are known as "bilious remittents." In such, jaundice is often present, causing the case to simulate one of yellow fever.

Diagnosis.—Remittent fever often closely resembles typhoid fever, so much so that a differential diagnosis can only be made positive by a blood examination for the estivo-autumnal parasite. The onset is more

abrupt than in typhoid, the remissions are more marked and the characteristic eruption of typhoid is absent. Remittent fever may also resemble yellow fever. The differential diagnosis will be considered under the latter head.

Prognosis.— In simple remittent fever the prognosis is always good. In severe cases, and in the so-called "bilious remittents," the prognosis is grave. A continuously high fever, with only brief remissions, hemorrhages, jaundice, suppressed urine with uremic symptoms, and typhoid symptoms are all unfavorable.

4. Pernicious Remittent Fever.

In these cases the type is extremely severe, embracing the salient features of pernicious intermittent fever, except that the temperature never reaches normal. Therefore no further description is necessary.

5. Malarial Cachexia.

This condition is also termed chronic malaria. It usually follows an acute form of malaria or repeated attacks. It may become established in residents of a malarial district without preceding acute attacks. It never originates except in malarious districts.

The general health becomes impaired, there is loss of flesh and strength, the digestion becomes deranged, the tongue is pale, flabby and coated, the breath often foul, and the bowels usually constipated. There is usually an irregular fever of a moderate degree, seldom exceeding 103°F . There is no chill, and the fever can not be said to partake of either a distinct intermittent or remittent type. A characteristic feature is the peculiar anemia always present, and which gives the patient a dirty-yellowish-brown or sallow complexion. The spleen is decidedly enlarged and indurated (ague-cake). Enlargement and induration of the liver may also be present. Various functional disturbances may be present. Neuralgia is not uncommon. Violent periodic headaches are very commonly present, and supra-orbital neuralgia is quite usual. The circulation is poor, the hands and feet cold, and edema of the feet and even general anasarca may result. The degree of severity of the symptoms varies according to the extent of the poison in the system and its pronounced effects upon spleen and liver. In very rare cases paraplegia or orchitis may develop. Tuberculosis, chronic dysentery, chronic Bright's disease and amyloid disease may develop, and prove serious complications.

According to Tyson, "The term 'latent intermittent fever' is applied to a combination of symptoms affecting persons living in

malarial districts—consisting in a weary, languid feeling, associated with want of appetite, headache, nausea, vomiting, constipation, and coated tongue. Sometimes the so-called 'bilious attacks' which exhibit the above symptoms in an aggravated form, especially the headache and vomiting, are malarial in their origin."

Diagnosis.—The chief difficulty may be in differentiating from anemia, but the history of the case and the enlarged spleen ought to make the diagnosis between the two an easy matter. The malarial plasmodium is also found in this form of malaria. Various chronic liver and nervous troubles are alleged to be due to chronic malaria when such is not the case.

Prognosis.—The prognosis is good provided the patient can be removed to a locality free from the malarial poison and the indicated remedy be persistently administered. Such mild cases of chronic malaria as are found in the Northern States are easily cured. In many such instances the diagnosis is erroneous. The spleen often fails to return to its normal size and condition, and the patient may suffer for many years, perhaps during life, in consequence.

6. Masked Intermittents.

The so-called masked intermittents differ only from malarial cachexia in that they develop no fever, the malarial manifestations being exhibited by various functional disturbances, especially of the nervous system. Neuralgia is the most common type, the supra-orbital branch of the trigeminus being most frequently involved, the occipital, intercostal and sciatic nerves with less frequency. The attacks are periodical, usually beginning in the morning and lasting several hours. Various other disturbances of the system may be present as a consequence of malarial poison, periodicity being the only indication of the etiological factor. Unless the malarial parasite is found in the blood an absolutely positive diagnosis can not be made. When occurring in a highly malarious district the presumption of malarial poisoning is justifiable.

7. Malarial Hematuria and Hemoglobinuria.

Reference has already been made to hematuria as a symptom sometimes occurring in severe hemorrhagic forms of malarial fever. This is especially the case in the milder varieties, such as occur in temperate climates. There may also be jaundice, great prostration and various nervous symptoms. Usually there is no chill, or else it is very mild in its character, consisting only of a cold feeling and the tips of the nose and of the fingers become cold, and the lips become blue,

immediately after which the urine is found to be bloody. The paroxysms may recur daily or on alternate days. If the microscope reveals red corpuscles, the condition is hematuria. If not, it is hemoglobinuria. The diagnosis of malaria can only be made by discovering the plasmodia in the blood.

Treatment of Malarial Fever.

Prophylaxis.—Residents of malarial districts or persons visiting such localities should select high ground for their residence and should if possible sleep on upper floors. As the greatest danger of infection is in the night, the night air should be avoided, it being best to remain indoors after the sun gets low until nine or ten o'clock the following day. Overexercise should be avoided, the skin kept in a healthy condition by appropriate bathing, and the stomach and bowels kept in order by judicious diet and regular habits. Dr. Goodno unites with all old school authorities in advising ten to fifteen grains of quinine a day as a prophylactic in cases where "the probability of infection seems considerable."

During and between the paroxysms usual hygienic measures will suggest themselves according to the circumstances and necessities of the individual case. The patient should be wrapped in blankets and given hot drinks during the cold stage. If agreeable, give sponge baths and cooling drinks during the fever stage, and provide with warm, dry clothing after the sweat. In pernicious intermittent during the chill stimulants—whisky or brandy—should be given freely, especially if there is much prostration. If the heart's action is weak strychnia should be administered hypodermically. Hot-water bottles should be applied about the body and hot mustard foot-baths employed.

Therapeutics. — Chininum sulph.—Throughout the civilized world Quinine is considered a certain specific, as Anders remarks, "An almost infallible remedy." Such opinions universally entertained must have for their basis a strong element of truth, especially when we consider the fact that this is no new theory but that for centuries Cinchona in some form has held first place in the treatment of malaria, and Quinine itself has been almost universally used and considered a specific far beyond the memory of the present generation. This being the case, we can not afford to ignore the marvelous virtues of the drug and allow our minds to be prejudiced against it simply because it is used without discrimination and commonly in massive doses. There is no doubt that of all drugs Quinine is most efficacious, and the harm wrought by its often wrong and indiscriminate use is reduced to the minimum when compared with the good it has done when it has reached

those cases for which it was truly a specific. Quinine is not the remedy for all cases of malaria, or even all cases of intermittents, but it very often is the remedy and probably in intermittents it should be employed in the majority of cases. The fact that in most instances Quinine must be administered in substantial doses is no argument against its homœopathicity, nor any excuse why it should not be prescribed when indicated. It should not be forgotten that it was over a century ago while Hahnemann was studying the effects of *Cinchona* upon the human system that he noticed the remarkable similarity existing between these effects and the symptoms of intermittent fever for which it was chiefly prescribed. This led him to a general investigation as to the relations existing between drug phenomena and sick phenomena which resulted in the promulgation of the homœopathic law of cure. Certainly then *Cinchona* or any of its preparations properly have a place in the homœopathic *Materia Medica*. The question of dose, here as elsewhere, depends entirely upon the views of the individual prescriber who should follow Hahnemann's directions and give the smallest dose which in his opinion is necessary for a cure.

According to the old school, Quinine is a parasiticide and its virtues in the treatment of malaria are due to its destructive action upon the malarial plasmodium in the blood. Binz has shown that a solution of Quinine, one to twenty thousand, has a killing influence on certain infusoria, and that a strength of one in seven or eight thousand can be secured in the blood by the administration of ten grains of Quinine. The view expressed by most recent writers upon the subject is that this action is strongest and most potent where the parasites are young and are free in the circulation, but that it has comparatively little effect upon the intracorpuseular parasite. However, Anders maintains that "Quinine cures malaria by acting directly upon the intracorpuseular hematozoa." Those who hold to the former view usually maintain that the entire daily quantity of the drug should be given at one dose from four to six hours before the succeeding paroxysm is expected, the object being to surcharge the blood at the time when the hematozoa sporulate. Others give the remedy in divided portions, administering the last dose from four to six hours before the next paroxysm is due. The total amount supposed to be required to cut short the disease, in the case of intermittents, being "from 16 to 20 grains in most temperate climates." After the attacks cease to occur, the drug is continued in amounts of 6 or 8 grains daily for several days. I have thus indicated the usual methods of administering Quinine by the old school, but not for the reason that I would sanction the dosage or the indiscriminate use of the drug. Whether Quinine acts

as a parasiticide or not, there is one thing certain it does not act the same in all cases, in some failing entirely in its purpose and leaving behind a train of disturbances evidently due to the physiological effects of the drug — cinchonism. The old school has no method of discrimination, and can only judge that the drug is, to them, mysteriously inapplicable when it has failed to do its work. I submit that the dilemma is entirely overcome through a knowledge of the homœopathic pathogenesis of the drug. As in the case of other parasitic and microbic diseases where the fact that they are due to parasites or bacilli does not in the least interfere with the action of drugs, as based upon homœopathic provings, so in malaria. The drug to cure any form of malaria, whether it be due to parasites or not, is that drug which in its pathogenesis most closely resembles the symptoms of the individual case. Quinine is nearly always well indicated in a typical case of intermittent fever, but is rarely indicated in atypical or irregular cases, and seldom indicated in remittent fever. As in other diseases, so here, if the remedy be well indicated, a comparatively small dose only is required. If it be not closely indicated, it will be found that more substantial doses are necessary. If Quinine is not indicated at all, or but slightly, it may even then, in enormous doses, temporarily control the paroxysms by neutralizing the poison, but the disease is not cured, and the evil consequences of malaria and Quinine combined may prove quite disastrous to the future health of the patient, often giving rise to an obstinate malarial cachexia.

Dr. T. F. Allen says that while Quinine “arrests the development of low forms of vegetable life, and especially of the poison of marsh malaria, it rarely antidotes the effects of the poison on the system;” and for this reason the drug is very seldom useful in the treatment of the many phases of chronic malarial poisoning or even in acute cases after the effects of the poison are well developed.

The chief indications for Quinine are that the paroxysms recur at the same hour every day or every other day, or else occur a little earlier each day; distinct stages, *severe chill* with violent shivering and aching *pains*, then fever with violent thirst, followed by sweat which is often profuse and exhausting; apyrexia perfect; generally great sensitiveness and often pain on pressure in dorsal region. In irregular forms of intermittent fever, remittent and pernicious fever, masked intermittents (for periodical, supraorbital neuralgia), and malarial cachexia, Quinine may be useful in moderate doses if well indicated. Gatchell offers the following suggestions regarding the dose: “Begin with 2-gr. doses of the 1x, every two hours. If there is no recurrence, continue the medicine in decreasing doses. On the contrary, if a second parox-

ysm appears, increase the dose; give grs. X of the crude drug, three or four hours before the expected appearance of the next paroxysm. In some cases, when the Bisulphate has no effect, the disease will yield to a pill containing one gr. each of *Quin. bisulph.*, *Chinoidinum*, *Capsicum*. Repeat every three hours. Quinine should be given on an empty stomach."

Chininum ars. — This drug is rapidly coming into favor in the treatment of malaria. By many it is substituted for the sulphate, but this should not be as the indications are distinctly different. Our knowledge of its action is chiefly derived from clinical sources. It produces a fever closely simulating an intermittent, while the neuralgias resulting from its use are periodical in their character. It evidently combines, more or less, the effects of both Arsenic and Quinine, from each of which, however, it is markedly different in its totality. Unlike the sulphate it is never indicated in typical intermittents, but in irregular types, in remittent fevers, and in malarial cachexia. Its indications in intermittent fever are as follows: chill always in forenoon, not at a regular hour; sometimes once every day, again every other day; sometimes paroxysms close with perspiration, sometimes without; before attack, headache, yawning and stretching. Chilliness coming in waves in evening, with restlessness; goose flesh, worse on moving hands and feet to a cool place in bed, also on motion, and by thinking of it. After chill, fever toward midnight; pulse full and strong, with inclination to throw off covers. No sweat after fever, but weak broken-up feeling in morning and no appetite for breakfast. I generally employ the second trituration, but often give one-half grain doses every two hours.

Arsenicum alb. (3x). — This drug probably ranks next in importance to Quinine in the treatment of intermittents, and is more frequently indicated and most efficacious in irregular types, remittent fevers, masked intermittents, and malarial cachexia. The use of Arsenic in the latter conditions is indorsed by the old school, and it is the remedy they almost invariably prescribe in all malarias where Quinine has failed. They generally use Fowler's solution, but some prefer Arsenious acid in minute doses. The chief indication for Arsenic in intermittent fevers is the irregularity and inequality of the three stages. The chill is not well defined, though the fever is, and often the sweat does not bring relief. Often the chill and heat are intermingled. Withal we usually have present the characteristic prostration, restlessness and thirst of Arsenic, and more or less gastro-enteric irritability. In long-standing cases the apyrexia is marked by symptoms indicating a bad state of the system — cachexia. Often dropsical indications are present, due to an

enlarged liver or spleen. Arsenic is also useful when in such patients neuralgia or headaches supervene, evidently due to the malarial poisoning. It is said to be most often indicated in malarial fevers after the failure or abuse of Quinine. In remittent fever the anxiety and restlessness, peculiar thirst and characteristic gastro-intestinal symptoms are of chief importance. It is especially useful when typhoid symptoms supervene.

Cinchona (2x). — Useful in all malarial fevers. In intermittent fever the three stages are well developed, but the paroxysms do not recur with the same clock-like regularity that they do in Quinine; there is also less cachexia, though the patient may have a sallow look and be very weak and anemic. The type may be either tertian or quartan. The chill and heat are ordinarily unaccompanied by thirst, but there is usually violent thirst and sometimes headache preceding the chill, and may be thirst during the hot stage, and nearly always thirst after it. During heat the face is fiery red, and there is headache and often delirium. The sweat is very profuse and debilitating. The apyrexia is marked by anemia, great prostration, loss of appetite or canine hunger, soreness of the liver and spleen, etc.

Apis (3x to 30x), according to Wolf, is one of the most important remedies in all kinds of intermittent fevers, and indeed has been used everywhere with great success. (Raue.) Chill with thirst about three or four o'clock P. M.; worse in a warm room or near the stove; renewed chilliness from slightest motion, with heat of the face and hands. *Heat*, especially in the chest, pit of the stomach, bowels, female organs and hands, with muttering and unconsciousness; diarrhea; shortness of breath; drowsiness or sleeplessness; rarely thirst. *Sweat* alternates with dryness of the skin; no thirst. Nettle-rash during sweat or apyrexia. During the *apyrexia*, pain under the short ribs, worse on the left side; great soreness of all the limbs and joints; great debility; enlargement of the abdomen; swollen feet and scanty urine. Apis is, therefore, indicated not only in recent but also in protracted and badly treated cases. After it *Natr. mur.* follows well. (Raue.)

Natrum mur. (30x). — An invaluable remedy in intermittent fever, especially inveterate or badly treated cases; after Quinine; in damp regions, or near newly turned ground. Chill 10 to 11 A. M., beginning in feet or small of back; blue nails; thirst; *bursting headache*; nausea and vomiting. Heat, with violent headache and thirst; chilliness over the back, and sweat in axillæ and soles of feet. Profuse perspiration. During apyrexia; stitches about the liver; languor; emaciation; sallow complexion; loss of appetite; fever blisters on the lips.

Eupatorium perf. (Tincture). — Especially valuable in intermittents, either quotidian, tertian or quartan, the paroxysms being characterized by violent bone pains, great pain and soreness in the muscles, violent headache and vomiting, the latter occurring especially from taking a drink of water, also vomiting of bile as the chill passes off. According to T. F. Allen the latter is even more characteristic than the violent bone pains, though such is not the usual experience. Thirst always begins several hours before the chill, and continues during the chill and heat. The chill and heat are usually well marked, but the sweating stage does not contraindicate the use of the drug if it is otherwise well indicated. I once cured the most violent case of quotidian intermittent of over a year's standing, that I ever saw, with one prescription of Eupatorium, where with the violent break-bone pains and vomiting there was an excessively profuse sweating stage, so that the water actually ran from the pallet, on which the patient was lying, to the floor.

Eupatorium purp. (Tincture). — Chill at different times of day, every other day; begins at small of back, and spreads over body; violent shaking with comparatively little coldness; bone pains; lips and nails blue; thirst during chill and heat. Chilly when changing position during sweat. Dysuria a prominent symptom.

Gelsemium (Tincture or 1x). — It is especially valuable in malarial fevers, especially in those of recent origin, where the system is not thoroughly impressed by the poison; either remittent or intermittent; generally the rise in fever occurs toward evening with drowsiness, languor, dizziness, blindness, prostration, little or no thirst, slight sweat, which relieves; severe nervous symptoms.

Ipecac (3x). — Intermittent fever when gastric symptoms predominate; also after abuse of Quinine; in beginning of irregular cases, especially if there is much nausea; also, like *Natr. mur.*, chill, fever, and sweat with frontal headache. It is especially useful in mild forms of tertian. It is very similar to *Eupat. perf.*, though it has more nausea and no bone pains. Allen says, "The paroxysms of *Eupat.* are only partially developed, while those of *Ipecac* are, as a rule, perfectly developed." The common indications for *Ipecac* are backache, short chill, long fever; heat usually with thirst; raging headache, nausea and cough, sweat last. External coldness; internal heat; followed by sweat. Shivering at 4 P. M.; then chilliness without thirst.

Capsicum (2x) is often a valuable remedy in intermittent fever. Formerly it was used extensively combined with Quinine. Chill begins in back, with thirst; worse after drinking. Shivering and chilliness after every drink. Chill, followed by sweat, or by *heat, with sweat* and thirst. Fever heat, with violent burning.

Cedron (3x).—Useful in intermittents, especially those of an obstinate character, accompanied by violent cerebral disturbances, and which continually recur with clock-like regularity in spite of other treatment; also, more particularly, if originating in damp, warm, marshy climates, or in tropical countries, and when accompanied by an enlarged liver and spleen, general anemia and dropsy. Has also cured intermittent neuralgia and chorea. According to Casanova, residents of hot countries are more susceptible to the influences of the drug.

Ferrum (3x to 6x) may be useful in chronic malaria where there is anemia and great prostration, and a profuse clammy debilitating sweat; especially after the abuse of Quinine, with enlarged spleen, anemia and dropsical swellings of the extremities.

Consult also: Am. mur. (6x), Angust. v. (2x), Aran. (30x), Bry. (30x), Cact. (3x), Carb. an. (30x), Carb. veg. (30x), Cina (3x), Coccul. (3x), Crotal. (6x), Cupr. (6x), Elat. (1x), Eucal. (1x), Hell. (3x), Hydras. (3x), Ign. (30x), Kreos. (3x), Lach. (30x), Lob. (2x), Lyc. (6x), Meny. (2x), Merc. sol. (3x), Mur. ac. (2x), Natr. ars. (30x), Nitr. ac. (6x), Nux v. (30x), Op., (30x), Petrol. (30x), Phos. ac. (2x), Podo. (3x), Puls. (30x), Rhus tox. (3x), Sab. (2x), Sang. (2x), Sep. (30x), Stram. (3x), Sulph. (30x), Taran. (30x), Ver. vir. (1x).

YELLOW FEVER.

Definition.—An acute infectious, non-contagious, malignant disease, occurring as an endemic and epidemic, chiefly in subtropical climates, and characterized by fever, jaundice, and a tendency to hemorrhages and collapse.

Pathology.—The skin is of a lemon-yellow color due to hepatogenous jaundice, and there are hemorrhagic extravasations under the skin, but there are no constant or distinct internal lesions found. The liver presents the most characteristic change. It shows advanced fatty degeneration of its cells and is of a "café au lait," or coffee-and-milk color. The liver cells present various stages of fatty degeneration. The mucous membrane of the stomach is hyperemic and more or less swollen, and shows spots of hemorrhagic extravasation. The latter are also found in various serous membranes of the body. There is frequently found in the stomach the "black vomit," which consists of mucus and altered blood. The spleen is not enlarged, but is dark and friable. The kidneys may show parenchymatous swelling or even acute nephritis. The heart muscle is pale and degenerated. The brain and its meninges are hyperemic. The serum of the blood contains dissolved hemoglobin, due to the destruction of the red cells.

Etiology.— Yellow fever is a disease of hot countries and of hot weather. It is endemic chiefly in the West Indian Islands, parts of the coast of the Gulf of Mexico, and the west coast of Africa. Periodic epidemics appear occasionally in the southern cities of the United States. Occasional isolated cases are imported to northern cities, but the disease never spreads. It is unknown in Europe. Long-continued high temperature and atmospheric humidity favors the spread of the disease, while it is completely arrested by freezing weather, a single frost often putting an end to its inroads, though it may start in again with modified violence if warm weather returns. Epidemics are more common on the seacoast and in low latitudes, an elevation of one thousand feet being considered safe from their ravages. Like malaria, the poison is more virulent at night. The disease is favored by unhygienic conditions—filth, overcrowding, bad ventilation, etc., such as are found on board ships and in densely populated portions of a city. *Fear*, depressing emotions, physical exhaustion, and intemperance are important predisposing factors. A recent writer claims that the disease is not infectious, and that if the element of fear were eliminated it would be a disease no more to be dreaded than measles.

The disease attacks all races and ages. Negroes are not so liable to the disease as whites. Children are more liable than adults, but very young children are comparatively exempt. Yet as Tyson remarks, it is through the young that the disease is maintained in a native population because protection is secured by a previous attack or long residence in a locality in which it is endemic, and it is the young who, as they grow up, furnish the pabulum for fresh cases. More males have the disease than females, probably on account of their increased exposure. Natives are less liable than strangers, and when attacked the disease in them runs a mild course. One attack usually bestows permanent immunity, but there are many exceptions to this rule.

Modes of Infection.— The methods of infection are not definitely known. The disease is not given off direct from the body either before or after death, but the poison is cast off in some unknown way, and requires farther development in a favorable soil, after which infection can occur. It may be carried a moderate distance in the air and may be conveyed any distance by fomites—clothing, baggage, and even letters being sources of infection. The disease is introduced into large cities not only by importation, but also by freight and merchandise. The poison is very tenacious, it often being difficult to successfully disinfect the infection bearer. The spread of the epidemic is often checked by trivial causes, such as water courses, rows of trees, high fences, walls or houses.

It is generally believed that yellow fever is a disease of microbic origin, though up to the present time no specific organism has been isolated. Nevertheless, recent observations and experiments seem to warrant a reasonable belief that there is a specific germ, and that this is conveyed from one person to another by the mosquito in precisely the same manner as the malarial parasite is conveyed. It has certainly been proved beyond doubt, that the mosquito may and has acted as the bearer of the infection, but that this is the only method of infection has not yet been demonstrated. Persons inoculated with the yellow fever virus by means of mosquitoes known to have been in contact with yellow fever, have had the disease in a mild form, and have thereafter failed to contract the disease when inoculated with the blood of a yellow fever patient.

Symptoms. — The period of incubation varies from one to twenty-five days, usually three or four days, rarely over five days. The more severe the cases, the shorter the stage of incubation.

The disease consists in severe cases of three stages: (1) stage of invasion; (2) stage of remission; (3) stage of relapse.

Stage of Invasion. — The onset may be preceded by languor, headache, anorexia, etc. Usually, however, the onset is abrupt, commencing with a chill, which is promptly followed by headache and severe pain in the back and limbs, the temperature rising to 103° , 104° , or even 105° F. Hyperpyrexia is rare. There may soon develop restlessness, mental confusion, and a delirium that is sometimes violent in character. In most instances, however, the mind remains clear. In children there are often convulsions. The pulse usually corresponds with the fever, but in some cases there is a slow pulse from the first, ranging from 40 to 60. The skin is hot and dry. The stomach is irritable, and there may be nausea from the beginning and sometimes vomiting even of blood. Frequently there is tenderness and oppression in the epigastrium and sometimes burning sensations. In very mild cases in the first stage the patient may be around and only have a slight fever, headache, lassitude and probably nausea.

This stage usually lasts two or three days, though it may continue five or six days, or, on the other hand, terminate within six or eight hours.

Stage of Remission. — This is the second stage, and is marked by a fall of temperature frequently to subnormal, and the disappearance of the other symptoms. In mild cases this may be the beginning of convalescence. A slight jaundice appears about the fifth day. In most instances, however, the patient feels miserable. There is prostration, gastric irritability, mental dullness and jaundice. In

severe cases this stage is of short duration, lasting from a few hours to two days.

Stage of Relapse.—This is the third stage, or the stage of febrile reaction, or secondary fever. The temperature now rises again, and the nausea and vomiting return. The pulse is weak and rapid, or may be very slow. The vomiting is soon very distressing and becomes hemorrhagic. The blood may be vomited unaltered, or in very bad cases have a tarry appearance; but the characteristic "black vomit" is usually present. This consists of broken-down corpuscles and hematin, and gives the appearance of an infusion of coffee, depositing a sediment simulating coffee grounds. There is often severe abdominal pain and a black, offensive diarrhea. Hemorrhages may occur from all mucous membranes, and subcutaneous hemorrhages may also occur. The skin presents a pronounced yellow or bronzed tinge, from which comes the name of the disease. The tongue becomes dry and brown, or even black. In some cases it is red and fissured; sordes may appear on the teeth and lips, and a general typhoid condition supervenes. The urine usually contains albumin and casts, and may contain blood. It may be suppressed, and uremic symptoms appear, even to convulsions or, in fatal cases, to coma. In some cases there is delirium, frequently of a maniacal character.

In some cases of great severity, in this stage a febrile reaction does not take place, the patient passing at once into a state of profound collapse. Fatal cases usually die between the fifth and the seventh day of the disease. In favorable cases convalescence is always slow, and relapses common.

Diagnosis.—The presence of an epidemic with the characteristics above mentioned—sudden onset, bone pains, nausea and vomiting, and later the jaundice, black vomit, etc.—renders the diagnosis easy. In the first cases that appear there is danger of confounding the disease with pernicious malarial fever. In the latter the remissions occur earlier, the chill is of longer duration, and the malarial organisms may be found in the blood. The vomited matter of yellow fever is much more highly acid than that of malarial fever.

Prognosis.—This depends upon the character of the epidemic, the mortality ranging from 15 to 85 per cent. The latter is lower in localities frequently visited by epidemics, sometimes being as low as 7 per cent. The death rate is lower in private practice and among native races, in the young and in those who do not use alcohol.

The results of homœopathic treatment in yellow fever are very encouraging, as we learn from the reports of Drs. J. P. Dake, F. H. Orme, W. H. Holcombe, and others who have had experience with

the disease. Dr. Louis A. Falligant, in Arndt's "System of Medicine," says: "It will be seen from the above figures that my loss in cases seen before black vomit occurred was only 17 in about 900, or less than 1 in 50, and in the total of all cases treated by me 32 in over 900, or a fraction over 3 per cent in an epidemic in which the average death ratio was about 15 per cent. I claim no merit for this result beyond that which attaches to the treatment employed, and that treatment was *homœopathic*."

Dr. Hardenstein gives the comparative death rate under homœopathic treatment, during the outbreak of the disease in 1882, in Vicksburg, Mississippi. Rate under Homœopathic treatment, six and one-seventh per cent. Rate under Allopathic treatment, seventeen per cent.

Intense capillary congestion during the first stage and later, cerebral symptoms, hemorrhages, suppression of urine, and pronounced jaundice are unfavorable symptoms. The black vomit is not by any means necessarily a fatal symptom. Malignant cases die within two or three days.

Treatment.—*Prophylaxis.*—To prevent the spread of the disease there should be a strict and thorough disinfection of all ships, merchandise and mails arriving from infected localities. Patients should be quarantined, and their clothing, bedding and all personal belongings as well as the apartments occupied should be disinfected. Infected localities should be avoided by all who are susceptible to the disease, especially, by those who are not acclimated. Persons residing in such localities who have not been immunized should if possible go elsewhere, only such remaining as are absolutely necessary for the care of the sick. Those who are compelled to remain should lead temperate lives, eat and sleep regularly, use only wholesome food, and bathe regularly. In view of the possibility that the mosquito is the only bearer of the infection, it is proposed that hereafter yellow-fever patients be protected from these insects by means of mosquito-netting; and thus, it is hoped, the spread of the disease may be prevented. Protective inoculations with blood serum from a patient or an immune have not proved satisfactory.

General Management.—The patient should be required to go to bed at once, and remain there until well. "In conditions when the stomach is disturbed, and in all the more serious cases, he should not be allowed to get out of bed or even raise his head from the pillow—a violation of this precaution often being immediately followed by serious, and often grave, gastric disturbances. On no account let him get out of bed, even to use a chamber." (Falligant.) Nourishment

and medicine should be administered through a tube or spout cup. The room should be well ventilated, but exposure to strong draughts of air must be avoided. Everything in and about the room, including the person of the patient and especially the bed linen, should be kept scrupulously clean. The diet should be very light and entirely liquid. Malted milk, peptonized milk, beef or mutton broths may be allowed in small quantities if the stomach will bear them. If not, they may be administered per rectum. Dietetic indiscretions must be carefully avoided during convalescence, solid food never being permitted until the patient is entirely well. For the thirst during the first stages, Falligant found iced lemon-soda the best. Pounded ice may be allowed. Falligant found pulverized ice with brandy on it more effective in the burning thirst and vomitings of the second and third stages than any other internal treatment. Iced champagne is probably preferable. As a rule stimulants are only to be employed when there are evidences of prostration and collapse. During the fever sponging with tepid water is grateful to the patient. When there is exhaustion from profuse sweating, sponging with alcohol is of service.

Therapeutics.—During the *first stage* the remedies oftenest required according to their symptomatic indications are: Aconite, Belladonna and Gelsemium. If there is a tendency to coldness and collapse from the first, or at any time later on: Camph., Arsen., Verat. alb. If gastric irritability: Ipecac, Nux vom., Ars. If great exhaustion: China, Sulph. acid.

Second stage: Belladonna, Bryonia, Arsen., Nux vomica, Sulph. acid, Plumbum acet., etc.

Third stage: Crotalus, Lachesis, Arsenicum, Argentum nitr., Phosphorus, Carbo veg., and Sulphuric acid. Of these Crotalus and Lachesis in their pathogenesis most nearly correspond to the third stage of yellow fever in severe cases. Their use has been attended with most satisfactory results. As a rule, all remedies should be used in low dilutions. The various special symptoms and conditions arising in the course of the disease, such as anuria, dysuria, hemorrhages, convulsions, etc., should be controlled by the usual remedies for such states, according to the symptomatic indications.

DENGUE.

Synonyms.—Break Bone Fever, Dandy Fever.

Definition.—An acute, infectious, epidemic febrile disease, occurring chiefly in tropical and subtropical countries, and characterized by two paroxysms of fever with an intermission, accompanied by extreme arthritic and muscular pains, and sometimes eruptions on the skin.

Etiology. — The causes of the Dengue are unknown. It occurs in hot climates and in hot weather, and may be favored somewhat by unhygienic conditions. It attacks all ages, and has no regard whatever for social standing, the rich and the poor being its victims, and all alike susceptible to the disease. The epidemics spread, like those of contagious diseases, along the common routes of travel, and there are many evidences of the contagious character of the disease, but this has not been fully established. One attack does not immunize from subsequent attacks. No characteristic lesions have been discovered.

Symptoms. — After a period of incubation, lasting from two to six days, during which there may or may not be prodromes, the attack begins abruptly. There is a slight chill, immediately followed by fever, the temperature rising rapidly to 102° to 106° F., according to the severity of the attack. The face is flushed, the conjunctiva congested, and the pulse is frequent, from 100 to 120. Simultaneously with the fever there develops an agonizing headache and backache and intense pain in the joints and muscles. The pain seems to involve the bones as if they were breaking, hence the common term of "break-bone fever." The muscles are sore and tender. The joints become painful, tender and frequently red and swollen. The large and the small joints are equally affected. Usually there is great prostration. Delirium is not marked except in children. The tongue is usually coated, there is loss of appetite, frequently nausea, extreme thirst, scanty urine and constipation. In rare cases there may be severe vomiting and purging. Hemorrhages from the nose and gums and other mucous surfaces have been noted. An erythematous eruption resembling that of scarlet fever is usually present. Sometimes there is urticaria or herpes. The lymphatic glands are often swollen. After from three to five days the fever terminates by crisis, sometimes the temperature becoming subnormal. The crisis may be marked by profuse sweating or diarrhea. As the fever subsides, the pains and other symptoms disappear, leaving the patient sore and stiff, and greatly prostrated. After an interval of two or three days, a second febrile paroxysm occurs, with a repetition of all the former symptoms, though in a milder degree, and the paroxysm of shorter duration. The second paroxysm is followed by a slow convalescence, owing to the great prostration. Relapses are common. The average duration of the disease is about seven or eight days. Complications are rare. Severe catarrhal inflammations of various mucous membranes are not uncommon.

Diagnosis. — When there is an epidemic established, the diagnosis is easy, but in the first cases and in occasional sporadic cases that occur, the disease is liable to be confounded with acute rheumatism, influenza,

or yellow fever. The eruption may cause a mistaken diagnosis of scarlet fever. As a rule, however, the severe pains with the characteristic course of the disease will establish its nature, though it is not always possible at first to differentiate from influenza. The jaundice, black vomit, and characteristic nervous symptoms of yellow fever are absent, though according to Tyson "both Eugene Foster and D. C. Holliday have seen black vomit similar to that of yellow fever, and in one case copious hemorrhage from the bowels, which persisted three months and terminated in death, was observed."

Prognosis.—This is almost uniformly favorable. Very rarely fatal complications arise.

Treatment.—Cold or tepid sponging are grateful during the fever. Hot drinks should be given in most cases, and the usual efforts to produce diaphoresis should be adopted. If the temperature is very high, a cold pack is often very beneficial. In some instances the pain is so intense that it becomes necessary to administer an opiate. Stimulants may be administered freely for the prostration. During convalescence the diet should be generous, but consist of easily digested food.

The remedies usually required are Acon., Gels. Eupat., Bry., Ars., Rhus and Cimic. During convalescence, Cinchona and Nux are mostly required. Low dilutions are best.

CALENTURA.

Synonyms.—Hot Fever, Fiebres Calentura.

Definition.—A tropical fever of a malarial type, characterized by suddenness of onset and continued fever. Delirium was once supposed to be its chief characteristic, but this is not true of the type now recognized as calentura. According to Dr. C. E. Fisher, this is "really a counterpart of the 'bilious remittent' of the Southern States, and the typical remittent fever of other sections, minus the severer bilious symptoms of the Southern type."

Pathology.—As death rarely occurs, no morbid changes have been noted.

Etiology.—This disease is only known in the tropics and is only of practical interest to Americans in that it occurs in Cuba and the Philippine Islands. Persons not acclimated are most subject, but natives are also attacked. While supposed to be malarial in character, the malarial plasmodium has not been demonstrated. It prevails in the dry, hot season, and is supposed to be excited by exposure to the direct rays of the sun, especially in those not accustomed to the intense heat. According to Dr. Fisher the disease is of special interest to Americans "because it is held by native physicians and the laity that

subjects of Calentura are not very liable to yellow fever; this fact, if fact it be, affording much consolation to those who burn up for a few days, or chill almost to death for a while with it."

Symptoms. — The attack may be preceded by a slight chilliness, but as a rule prodroma are absent. The onset is sudden. The patient may have a chill, or complain of chilly sensations up and down the spine, and more or less aching of the limbs and general discomfort. This may be followed by intermingled chills and heat for a day or two. More often, however, there is a sudden accession of fever (possibly following a chill) with a rapidly rising temperature, which soon reaches to 103° F. and may go as high as 104° to 105° F. The fever may last for from three to five days, or even longer, and is of a continued type, there being only slight, if any, remissions. During the attack there is loss of appetite, coated tongue, great thirst, more or less nausea and vomiting, constipation, severe headache, muscular pains, restlessness and marked asthenia. After a few days the temperature falls rapidly, other symptoms disappear, and the patient is convalescent, only retaining a profound weakness from which he slowly recovers.

Diagnosis. — Calentura resembles a mild type of dengue, but the intense basilar headache, the distinct intermissions of one or two days' duration, the characteristic rash, and the profound prostration of the latter are not present.

In cases where bilious symptoms predominate, yellow fever may be suspected, but the real characteristics of that disease, such as the lemon or greenish-yellow color of the skin, the "coffee-ground" vomiting and albuminuria are absent.

Prognosis. — Uncomplicated cases invariably recover within from seven to ten days.

Treatment. — *Prophylaxis.* — This consists chiefly in avoiding exposure to the sun's rays, by carrying a large white umbrella. A light, cool head gear should also be worn, and appropriate cotton or linen clothing.

General Treatment. — At the onset the patient should go to bed, and remain there until entirely well. He should be given a cool sponge bath occasionally, and if the bowels are constipated, a mild saline laxative. As soon as the fever is gone, nourishing, easily digested food should be freely administered at regular intervals.

Therapeutics. — **Gelsemium** (Tincture). — This is considered the chief remedy in most cases. The attack is marked by chilliness, great languor, muscular weakness, basilar headache and dull pain in the back and limbs. The patient is apathetic and wishes to lie quiet, and be let alone. The pulse is full, quick, soft and easily compressed.

Aconite (1x).— This remedy is often called for when with the high fever there is less of the languor and aching which calls for Gelsemium, and the patient instead of being apathetic is restless and anxious. Gatchell says if given early, it will shorten the duration of the attack to three or four days. Fisher says, "Aconite is not often demanded."

Eupatorium perf. (Tincture).— This drug is called for where severe bone pains and muscular soreness are the chief symptoms.

Belladonna (2x).— The characteristics of this drug are often present— high fever, with flushed face, throbbing carotids, bounding pulse, severe throbbing headache and aggravation from light and noise. It is especially useful in plethoric subjects, and where the attack comes on rapidly after exposure to the intense rays of a tropical sun.

Consult also Bryonia (2x), Verat. vir. (1x), Ipecac (2x), Sanguinaria (1x) and Rhus (2x).

INFLUENZA.

Synonyms.— La Grippe, Grip, Epidemic Catarrhal Fever.

Definition.— An acute contagious epidemic or pandemic disease (occasionally endemic). It is characterized by fever; catarrhal inflammations of the respiratory and usually of the gastro-intestinal mucosa are present. Of the complicating lesions those of the respiratory organs are most important— lobar pneumonia, broncho-pneumonia, pleurisy, or empyema. There may also be abscess of the lung; abscess of the brain, meningitis, purulent pericarditis and nephritis.

Etiology.— The disease occurs pandemically, often spreading over whole countries or several countries with the ordinary rapidity of travel, and attacking large numbers of people. The spread of the disease is not influenced by the direction of prevailing winds. It usually starts in the East, and travels westward with uniform regularity and speed. The disease is not affected by sex, age, condition of life, climate or atmospheric changes. Old people and those of lowered vitality from neurotic or other causes are the principal sufferers, but even those who are in most robust health are not exempt. One attack does not bestow immunity from subsequent attacks, as relapses are common, and those who have once had the disease seem most susceptible during fresh epidemics. According to Anders, who has made an exhaustive study of the subject, there is a decided antagonism existing between influenza and malaria, and it is probable that they are rarely combined in the same individual.

The specific cause of influenza is presumed to be the bacillus of Pfeiffer, discovered in 1892. At all events this organism is invariably present in grip, and is found in no other diseases. It is said to cause the disease in monkeys and apes by inoculation. The prevailing idea

is that the germ is carried by the air, only acquiring virulence under certain favorable atmospheric or telluric conditions, and that it enters the system through the respiratory tract. It is generally agreed that the disease is slightly contagious by contact, and that possibly it may be conveyed by fomites.

Symptoms.—After a period of incubation, which rarely exceeds two or three days, there develop symptoms which are greatly varied in their intensity and character according to the severity of the affection and the reaction upon the nerve centers, their character depending upon whether the respiratory or gastro-intestinal mucous membrane is chiefly involved.

The onset is usually abrupt. There may or, in some instances, may not be a severe chill or chilly feelings. The temperature rises rapidly to from 101° to 105° F., according to the severity of the case, and is accompanied by intense headache, distressing myalgic pains and great prostration. The pulse is rapid and full, but may become weak and intermittent, especially in those who are old or debilitated, in such heart failure sometimes resulting. The profound prostration, taking place rapidly and persistently remaining, is one of the most marked features of the disease, and distinguishes it from ordinary severe catarrhal colds, which may in other respects present almost identical symptoms. In rare instances sudden prostration is the first symptom. In others the disease may be ushered in with a pronounced vertigo. The pain is also somewhat peculiar to the disease, though often closely simulated in acute catarrhal processes. The headache is laid down as chiefly frontal, but my own experience is that it is chiefly occipital, the two often being present. Severe pain in the back of the head and neck is most common. The pain may also involve the temples. There is aching in the eyeballs and at the root of the nose. The headache is often so intense that it leads to a diagnosis of meningitis. General neuro-muscular pains are usually present, the patient complaining of intense aching and shooting pains in the back, in the limbs, in the chest walls, and throughout the entire muscular system. The muscles, especially of the back and limbs, are tender and sore; the patient complains of a bruised feeling, and constantly changes position trying to find one more endurable. The temperature is highest at the beginning, usually falling slightly within twenty-four hours, and rarely, save when complications supervene, again rising to much above normal, but showing considerable irregularity and finally terminating by an imperfect crisis. Delirium is frequently present during the fever. Extreme depression of spirits is a frequent symptom, and restlessness and insomnia are common. Dyspnea and cyanosis may occur independent of any pulmonary or cardiac complication.

The catarrhal symptoms are usually either respiratory or gastro-intestinal in character, but it must be borne in mind that the symptoms of grip are protean, and may change rapidly or merge from one type into another. In most cases the respiratory mucous membrane is chiefly involved. There is coryza with sneezing, the conjunctivæ are reddened, there is increased lachrymation and some pharyngitis. Tonsillitis is not unusual. Laryngo-tracheitis is usually present with hoarseness, pain and a more or less severe racking paroxysmal cough, which often remains long after the inflammatory symptoms have disappeared. In most cases there is little expectoration. In other cases the bronchia become involved, and a mild or severe bronchitis is present with a harassing cough, and a profuse muco-purulent expectoration, sometimes containing blood. There may be pain in the chest and other usual physical signs. The bronchitis may pass into broncho-pneumonia, or a croupous pneumonia may supervene. These, when occurring, are usually the result of exposure during the attack or immediately before. Lobar pneumonia is also a frequent and very fatal complication. In most instances it comes on late in the disease, the onset being slow and insidious, the course long, and resolution tardy. The usual symptoms are modified, and the physical signs more or less masked by the existing bronchitis. There may be pulmonary congestion with edema or collapse without an active inflammation. In gastro-intestinal cases the catarrhal symptoms involve the digestive system. This form is very common in children, but occurs also in adults. There is a heavily coated tongue, persistent vomiting, diarrhea, tympanites, and pain and tenderness over the abdomen. Severe vomiting may even usher in the attack, especially in children.

In a small group of cases the infection seems to center about the heart, causing precordial distress, dyspnea, rapid, feeble pulse, and threatening, if not actual heart failure.

Some cases assume a typhoid form. There is marked delirium or stupor, dry tongue, sordes, etc.

In all cases of true influenza convalescence is slow, and in severe cases extremely slow. The prostration is very persistent, and often there is an obstinate cough. There may be also neuralgia, headache, insomnia, peripheral neuritis, and sometimes even insanity. Abscess of the antrum and other suppurative processes sometimes result. In addition to the complications already noted there may be empyema, pleurisy, abscess of the lung, meningitis, purulent pericarditis, and acute nephritis occurring during or after the attack and giving rise to their usual symptoms. Quiescent and chronic pulmonary tuberculosis is made active by influenza, often thereafter going on in the usual course to a fatal termination.

Diagnosis.—The diagnosis is usually easy. Doubtless many ordinary acute catarrhs are erroneously termed grip, such being the habit of many practitioners. Such cases arise from undue exposure or vicissitudes of atmosphere, whereas influenza occurs entirely independent of any such etiological factors. The high primary fever, the extreme prostration and the myalgic pains in influenza are usually sufficient for diagnostic purposes. Sometimes, in the beginning of gastro-intestinal cases typhoid fever may be suspected, but the sudden onset, and the absence of the typical temperature of typhoid should obviate any possible mistake. Oftentimes an early differentiation between influenza and cerebrospinal meningitis is impossible without a bacteriological investigation.

Prognosis.—With proper care and treatment influenza rarely proves fatal, except perhaps in the old and debilitated who may succumb to the extreme prostration, and those previously afflicted with pulmonary or cardiac disease. Death usually results from some supervening complication, especially pneumonia, and this is ordinarily brought on by the failure of the patient to take proper care of himself, especially as regards exposure, during the attack.

Treatment.—All cases, however mild, should remain indoors and in a warm room. Most cases should go to bed and remain there until entirely well. Exposure during or immediately after an attack of influenza may, even in mild cases, prove highly dangerous. If not bringing on dangerous acute complications, it may be the real cause of chronic sequelæ that affect the health and possibly endanger the life of the patient. The old school depends almost entirely upon Quinine, the coal-tar products, and opium, especially morphine. In some cases the suffering is so great that it is only humane to prescribe a palliative. For this purpose the coal-tar products, especially phenacetin and antikamnia, are usually employed. I am opposed to the use of these remedies on account of their weakening influence upon the heart. Equally good results, much better in fact, may be obtained from Dover's Powders, which, in my opinion, are the ideal palliative in this disease. Codeine may be used, and is preferable to morphine. As a rule, however, homœopathic remedies will do all that is required.

Therapeutics.—**Gelsemium** stands deservedly at the head of the list of remedies for influenza. The similarity of its symptoms to those present in a vast majority of cases is quite remarkable, and its action in controlling the disease from the very beginning is often marvelous. Its chief symptoms are febrile chilliness, heat of head and face, dull headache, especially in the occiput, suffused eyes, fullness at the root of the nose, drowsiness, languor, frequent pulse, extreme prostra-

tion and neuro-muscular pains, especially a languid aching in the back and limbs. It should be given in the tincture or first dilution.

Aconite (1x or 2x). — The well-known restlessness, etc., of Aconite may be present in the first stage, and call for this drug rather than Gelsemium.

Bryonia. — This drug ranks next to Gelsemium in importance, and often is the next remedy indicated. The two are frequently administered in alternation, which is not the best or proper thing to do. Bryonia is usually only useful in the respiratory form where bronchial symptoms characteristic of the remedy are present, or pneumonic or pleuritic complications are present. It must be remembered, however, that Bryonia also covers many of the muscular symptoms, and when these predominate over the fever, languor, prostration, etc., this remedy should be prescribed from the first. I always use the second dilution.

Eupatorium Perf. (Tincture). — This is a valuable remedy in influenza when bone pains predominate, also with much sneezing, soreness of the eyeballs, lachrymation, headache, pain and soreness in the muscles, hacking cough, soreness in chest.

Rhus tox. (3x) is useful when muscular symptoms predominate with great restlessness, but not a high fever calling for Aconite. Also in typhoid cases.

Belladonna. (3x) This remedy is frequently indicated and useful at the onset of the disease, especially in children. Later cerebral complications may call for it. Its symptoms are too familiar to require repetition here.

Arsenicum (3x). — Catarrhal symptoms intense, affecting especially the eyes, nose and throat. Discharges acrid, irritating. Shivering; hot, dry skin. Great prostration, even a slight exertion is followed by great exhaustion. Characteristic restlessness and thirst, desire for artificial warmth, anxiety, presentiment of a fatal issue of the illness. Later, great difficulty of breathing, with coldness, cold sweating, fatiguing, shaking cough; expectoration of tough, viscid sputum. Suited to enfeebled, old people.

Consult also Ant. tart. (3x), Ascl. cor. (2x), *Camph.* (Tinct.), *Cepa.* (3x), Dulc. (3x), Euphor. (3x), Ipec. (3x), Iris (1x), Kali bich. (3x), Merc. sol. (3x), Merc. cor. (3x), Merc. iod. (3x), Nux. vom. (3x), Sang. (1x), Squilla (1x), Sulph. (6x), Stict. (2x).

The symptoms of the disease with its various complications are so protean in character that a full list of remedies and their indications can not be given.

CHOLERA.

Synonyms. — Cholera Asiatica, Cholera Algida, Cholera Maligna, Cholera Infectiosa, Epidemic Cholera.

Definition. — Cholera is an acute, infectious, epidemic disease, caused by the comma bacillus, or spirillum of Koch, and characterized by vomiting, purging, severe cramps and collapse.

Pathology. — “There are no characteristic anatomical changes in cholera; but a post-mortem diagnosis of the nature of the disease could be made by any competent bacteriologist, as the micro-organisms are specific and distinctive. The body has the appearances associated with profound collapse. There is often marked post-mortem elevation of temperature. The *rigor mortis* sets in early and may produce displacement of the limbs. The lower jaw has been seen to move and the eyes to rotate. Various movements of the arms and legs have also been seen. The blood is thick and dark, and there is a remarkable diminution in the amount of water and salts. The peritoneum is sticky, and the coils of the intestines are congested and look thin and shrunken. There is nothing special in the appearance of the stomach. The small intestine usually contains a turbid serum, similar in appearance to that which has passed in the stools. The mucosa is, as a rule pale and swollen and often congested about the Peyer’s patches. Post-mortem, the epithelial lining is sometimes denuded, but this is probably not a change which takes place during life. In the stools however, large numbers of columnar epithelial cells have been described by many observers. The bacilli are found in the contents of the intestine and in the mucous membrane. The spleen is usually small. The liver and kidneys show cloudy swelling, and the latter extensive coagulation, necrosis and destruction of the epithelial cells. The heart is flabby; the right chambers are distended with blood and the left chambers are usually empty. The lungs are collapsed, and congested at the bases.

“The above appearances are those met with in cases which prove rapidly fatal. When the patient survives and death occurs during reaction, there may be more definite inflammatory appearances in the intestines and more pronounced changes in the kidneys and liver.” (Osler.)

Etiology.—Cholera exists as an endemic in India and in the tropics of Asia during the entire year, and occasionally spreads as an epidemic over large areas, visiting from time to time all civilized countries, its original starting point being India most often, and sometimes Asia. The epidemics sometimes spread over the entire globe, moving from east to west along lines of travel and commerce. The infection is

conveyed not only by those suffering from the disease, but also by freight, rags, bedding, etc., which have become contaminated by infected fecal discharges, but is not carried by the air. Epidemics travel slowly, and can easily be prevented by prompt and thorough quarantine and disinfection.

The predisposing causes are especially warm weather, low altitudes, nearness to the seacoast, humidity, impure water supply, dirty habits, filthy surroundings, overcrowding, and general unsanitary and unhygienic conditions. Any cause enfeebling the digestion, such as general illhealth, fatigue, taking cold, the alcoholic habit, depression of spirits, fright or anxiety, favor the disease. Any condition leading to diarrhea predisposes to infection. The disease attacks all ages and sexes, but old people seem especially liable to the infection. Cold weather will usually modify or check an epidemic, but unlike yellow fever, does not completely eradicate it.

The specific or exciting cause is the comma bacillus or spirocheta of Koch. This organism is found in the intestinal canal of those suffering with cholera, and is found in no other disease. It is claimed that true cholera is a "nitrite poisoning, the result of the growth of the specific spirillum." This bacillus is one half the length of the tubercle bacillus, and of a slightly curved or letter S shape. It can readily be cultivated and can reproduce the disease. It is killed by boiling, by drying and by acids, but it is not destroyed by freezing. It is found in the intestine, the dejecta, rarely in the vomitus, and in great profusion in the rice-water stools. It is not found after the stools become normal, nor in the diarrhea of convalescence. It may also be found in the stools of well persons during epidemics, the systems of such persons not affording the proper soil for its active development.

The bacillus leaves the body with the stools, and again finds its way into the human system, through contaminated water or food. The disease is not personally contagious, nor is it acquired by inhalation. As a rule the contamination of the drinking water corresponds with the virulence of the epidemic. The methods by which the germs may reach the system are thus detailed by Anders:—

"The *choleraic poison* may be conveyed with the water used for washing, cooking, and other purposes, to other fluids imbibed by man (beer, milk, tea, etc.), and also to foodstuffs taken by him (lettuce, cresses, and other raw vegetables, fruits, meats, bread, butter, etc.). The organisms live and maintain their virulence on these articles of food from four to seven days at least. The infection may reach the esophagus with the water used for washing the mouth or teeth, or that used for washing the utensils, dishes, food receptacles, etc. Again, the

hands, commonly those of laundresses and nurses, may become soiled in the careless handling of bed linen or garments worn by cholera patients, or the stools, and convey the poison to the mouth or lips, to be carried into the stomach along with the drink or food. It is quite possible that flies may transfer the infectious element to food articles." (Simmonds.)

"Probably the germs are *swallowed*, and the acid gastric juice may then destroy them if the size of the dose of the poison is not too large, or a sufficient number may pass into the intestinal canal and there manifest pathogenic powers. It is to be borne in mind that after the spirillum reaches the intestine, whether or not an attack of cholera is the result, depends both upon the size of the poisonous dose and upon the personal degree of immunity."

One attack of cholera does not furnish immunity from subsequent attacks.

Symptoms.—The period of incubation is usually between two and three days, but may be longer. During this time the patient may be entirely well, or show mild choleraic symptoms—nausea, slight pain, tenderness and distress in the abdomen and a mild or copious diarrhea. Either one or all of these symptoms may be present, and in addition there is often an increased peristalsis which is sometimes visible and palpable. These symptoms may pass off in from one to three days leaving the patient well, or merge into an attack of true cholera. These choleraic symptoms are sometimes termed "cholerine," which, however, is more appropriately applied to mild cases of true cholera.

Cholera may be divided into four stages:—

(1) The stage of preliminary diarrhea; (2) the stage of serous diarrhea; (3) the stage of algidity or collapse, and (4) the stage of reaction. These stages are not always distinct.

1. *Stage of Preliminary Diarrhea.*—There is a diarrhea that is usually painless, but may be accompanied by colicky pains. The stools are frequent, copious, and persistent, and are yellow or yellowish in color and give an alkaline reaction, attended with prostration and usually with nausea and vomiting. It is often difficult to establish this stage when the patient has already had the prodromal symptoms previously mentioned. Some authors include this stage with that of the incubation. It may be entirely absent, or last for a few hours or several days. The stools are considered as dangerous as at later periods in the disease, making an early diagnosis important.

2. *The Stage of Serous Diarrhea.*—Rapidly following the preliminary diarrhea, and sometimes occurring abruptly without it, there appears a profuse watery diarrhea, which is odorless and usually presents

the characteristic "rice-water" appearance. They may be frothy and rarely are colored with bile, and in very severe cases with blood. The term "rice-water" is given to the stools from the fact that they contain whitish flakes of desquamated intestinal epithelium. There may be pain and griping with the stools, but usually they are painless, the fluid being voided in gushes or in an almost continuous stream. In most cases, however, there are paroxysms of intensely painful muscular cramps, which usually begin in the fingers and toes and extend thence to the calves of the legs and abdominal walls. These paroxysms only last a few minutes each time but recur with great frequency. In some cases, termed "cholera sicca," these rice-water discharges are absent. In such death occurs rapidly and post-mortem examination shows the intestines to be full of the discharge, which has not been voided by reason of paralysis of the intestinal wall. Vomiting soon follows after the purging sets in. The vomitus is usually at first bilious, but assumes the rice water character and gushes from the mouth as from the bowel, in enormous quantities. As a result of the loss of fluids, the patient suffers great thirst, the tongue is dry, emaciation takes place rapidly, the skin is loose and wrinkled, the eyes are sunken and lusterless and surrounded by blue circles, the face and extremities become clammy and cold, the features pinched, the complexion livid, the lips dark, the extremities cyanotic, the voice feeble and husky. The surface temperature falls below normal, though the internal temperature rises to 102° F. or higher. The pulse becomes rapid and feeble; respirations are shallow and sighing. The mind may remain clear, but usually the patient is apathetic, and in grave cases there may be stupor or even coma. The urine is scanty or suppressed and contains urine in excess, albumin and casts. This stage lasts from two to twenty-four hours. In mild cases the disease may go no farther and the patient recover, but usually these symptoms of approaching collapse gradually merge into the more profound symptoms of the third stage.

3. *Stage of Algidity or Collapse.* — In this stage there is presented the same symptoms already noted though greatly intensified, except the purging and vomiting, which become less profuse and finally only dribble from the relaxed anus or cease entirely. The symptoms of relapse become more profound. The skin becomes ice-cold, more shrunken and the livid hue deepens. The voice is lost, the pulse feeble, intermittent and finally imperceptible, the respiration exceedingly shallow, the heart's action so weak that it is scarcely perceptible, and death often follows. This stage lasts from two or three to twenty-four hours.

4. *Stage of Reaction.* — This stage may immediately follow the

stage of serous diarrhea, or even that of the preliminary diarrhea, as has already been indicated. In such instances the patient is entirely recovered within a few days. Some authors note an intermediate or "warm stage," the symptoms of coldness and collapse disappearing, but death resulting from anuria and other complications. The restoration of the urinary secretion is the most favorable of all symptoms. In some cases after reaction takes place and the patient is apparently recovering, a relapse occurs which may result fatally. Occasionally cholera typhoid supervenes, in which there are true typhoid symptoms, including an eruption which is usually erythematous or roseolar in character. Such cases may recover. Acute nephritis may supervene, followed by uremia, coma, and death. As a result of secondary infection septic and pyemic processes may set in. Diphtheritic inflammations, especially of the colon, less often of the throat and genitals, erysipelas, multiple abscesses or boils and parotitis are common results. Bronchitis, broncho-pneumonia, or an irregular form of lobar pneumonia, or pleurisy may arise. Convalescence may be retarded by digestive disturbances, indiscretions in diet often bringing about a relapse.

Diagnosis.—The disease most often mistaken for a mild case of cholera is a severe case of cholera morbus. These diseases often present symptoms almost identical. However, the absence of an epidemic, or possible exposure to the virus, the history of dietetic imprudence or of exposure, the absence of "rice-water" stools, the presence of colicky pains and absence of violent paroxysms of muscular cramps, the absence of cyanosis and collapse, the absence of urinary suppression, and the absence of the cholera bacilli upon microscopic examination, is sufficient to establish a case of cholera morbus. Rice-water stools, cramps, and collapse are sometimes present in bad cases, where a bacteriological examination may be necessary. Poisoning by Arsenic, Tartar emetic, etc., present somewhat similar symptoms, but they are rarely confounded with those of cholera.

Prognosis.—This depends largely upon the nature of the epidemic, which differs according to locality and season, and also apparently as to the virulence of the poison. Cases beginning with a preliminary diarrhea are more apt to recover, probably because an opportunity for early treatment is given. Death frequently occurs during the stage of collapse, and often after the reaction has set in. There are individual factors which influence the prognosis. Some people have greater powers of resistance to the poison. Old age, alcoholism, previous ill-health, and debility are unfavorable. The prognosis is more favorable toward the close of an epidemic. The death rate is always high, but can be greatly modified by prompt and judicious treatment.

Treatment.—Prophylaxis.—This is of first and greatest consideration. Inspection and quick quarantine of all vessels arriving from infected ports should be enforced and a thorough disinfection of merchandise, baggage, etc. Local authorities should carefully inspect all water supply and see that it is in no way contaminated. Cellars, drains, vaults, cess-pools, alleys and streets should be cleaned, and, where necessary, disinfected by special means.

As regards individual prophylaxis the most important factor is the prompt and thorough disinfection of the vomitus and stools, as well as their receptacles and all cloths, bedding or clothing which may have been soiled by them, even though in a slight degree. This may be accomplished by the use of a five-per-cent solution of carbolic acid, or freshly prepared solution of chloride of lime. After having been thus treated and allowed to stand a few minutes, the dejections should be buried and the soiled clothing, etc., either thoroughly sterilized or burned. All utensils used in the sick room, including the dishes, should be disinfected before being taken from the sick room. Only the necessary attendants should be allowed in the sick room and they should persistently disinfect their hands each time after handling the patient or his dejecta, or anything with which the latter has come in contact. After the patient has vomited or had a stool, the mouth and the anal region should be cleansed with 1-2000 solution of the bichloride of mercury. These rules should be followed for one week after convalescence. Those who have been exposed should use only milk or water after it has been boiled and should especially avoid unripe fruits, salads, rich foods, uncooked foods and all alcholic stimulants. All fatigue, excesses and irregularities in living should be avoided.

Dr. J. P. Dake, in Arndt's System of Medicine, advises also that the individual be a little warmer clothed than usual, and especially to wear a bandage of flannel secured tightly around the body, extending from the arm-pits downward, also to avoid sitting and, yet more, sleeping in a draft of air; stay in at night, and take the usual amount of sleep. Take no unusual baths; take no unusual exercise, but attend to accustomed business. Attend no meetings in chilly or damp weather, except in rooms properly warmed; and, in general, avoid groups of people where the subject of cholera is being discussed, and keep away from rooms and houses in which there are, or lately have been, cases of cholera, unless compelled by duty to be there. Various protective inoculations have been experimented with, including blood serums, but it can not be said that any distinctive results have been obtained. The only medicinal prophylactic measures that have proved in anywise successful are those first recommended by Hahnemann. From his study

of the symptoms of the disease he advised the use of Cupruin as a prophylactic. His advice has been extensively adopted in several epidemics and with satisfactory results. It is well known that in Hungary rings, chains, plates and insoles made of copper have been worn as cholera preventives, and in 1849 Dr. Burq, of Paris, made the discovery that workers in copper possessed a remarkable immunity from cholera. The use of copper as a prophylactic for cholera has not been confined to the homœopathic school, but has been indorsed by leading old-school physicians. Dr. J. P. Dake advises the second decimal trituration, in three-grain doses, night and morning, which he says he has used "with the happiest results, in every cholera epidemic in America, except the first." Hahnemann's suggestion of Camphor as the first and most important remedy in cholera, has led to its extensive use as a prophylactic, especially in Italy. Referring to the epidemic of 1884 in Naples, Dr. Cigliano says: "The prophylactic which has enjoyed our entire confidence here (Naples) during the past epidemic, and also in those which preceded it, is Rubini's Camphor, given in drop doses, two or three times a day. A very large number of persons have used it, about fifty thousand, and all, with the rarest exception, affirm that they have been preserved by it, though they have nursed cholera patients, and have lived in houses wherein people have died with the disease."

The *general treatment* of the cholera patient is important. He should be placed in bed at once, kept at perfect rest and his body surrounded with hot-water bottles. Brisk friction is valuable, especially for the cramps. The thirst should be assuaged by bits of broken ice, champagne or lemonade. No food can be taken by the mouth. The patient should receive enemata of warm milk. In case much serum has been lost and exhaustion and collapse threaten, a normal salt solution may be injected through a long rectal tube, or given hypodermically into the subcutaneous cellular tissue. If collapse occur, stimulants should be used freely, preferably brandy hypodermically. During convalescence a return to solid diet must not occur until the stools are normal in character. Until then only milk, broths, gruels and prepared liquid foods should be allowed.

Therapeutics. — No more positive or convincing proof of the truth of the homœopathic law of cure could be asked than that furnished by Hahnemann in his recommendations for the treatment of cholera. In 1831 the disease had appeared in the East, and was rapidly traveling westward. All Europe was in a state of consternation. Meanwhile, Hahnemann, without even having seen a case of cholera, wrote down *Camphor*, *Cuprum* and *Veratrum album* as the remedies for the dis-

ease. Such they proved to be, and as Dake says, have saved more lives in jeopardy from that disease than all other drugs put together.

Camphor. — This drug is indicated when the discharges are scanty, or suddenly suppressed with icy coldness of the body and collapse. It is also useful at the onset of the disease before the characteristic choleraic discharges are established, the immediate prostration being very marked, the body cold, the voice husky. The mother tincture should be given, a few drops on sugar or in water every few minutes until reaction takes place. According to Allen, Camphor is not to be given if there is perspiration, or should be stopped as soon as that occurs. According to Dake, Camphor is not only useful in the beginning of cholera, but becomes the chief remedy again in the last, or collapse stage, of cholera, when the fury of the fight is past, and the forces of life are failing. "It will bring back the pulse, and restore warmth when stimulants and artificial heat have failed." This drug was used very extensively in Naples in the epidemic of 1884, and in other epidemics previous to that time. It is claimed by Dr. Cigliano that when given "in the early stages, that is, when there are already vomiting and purging, it arrests the disease, and prevents its further development in eighty per cent of the cases in which it is used; and when it fails in its quickly abortive action, it will still, with perseverance and in increased doses, be the means of bringing on the desired reaction, even when the patient falls into the stage of collapse, provided that he be not disturbed by other remedies." He also says that "in the stage of collapse, it succeeds with almost certainty, provided that no other remedies have been previously used." He strongly advises against the use of laudanum or any other remedy when giving Camphor, as they "disturb its beneficent action."

Cuprum (3x). — This drug is indicated later in the disease when serous diarrhea and muscular cramps are fully developed; body cold; skin blue; cramps of the muscles, muscles of calves and thighs drawn up into knots; violent cramps in stomach, abdomen and extremities, especially of flexors; violent, convulsive vomiting; hiccough; collapse; the stools may be watery, or gray stools with flocculent matter. *Cuprum arsenicosum* (2x), is a remedy that promises much in the treatment of cholera, but as yet has not been extensively used.

Veratrum album (1x). — Hahnemann advised the use of this drug for the same class of symptoms as Cuprum, giving it either alone or in alternation with the latter. It has, however, distinctive features of its own, which, when present, demand this drug and no other. The symptoms calling for Veratrum are terrible colic, even cramps, cramps in the calves, cold sweat on forehead, very profuse, watery, flaky stools,

violent retching and vomiting, great prostration, burning in the stomach, sensitiveness to touch. The violent retching and vomiting with cold sweat on the forehead and violent pain are the most characteristic, and differentiate the drug from other cholera remedies. *Veratrum* is particularly useful in the milder class of cases that more especially simulate cholera morbus.

Arsenicum album (3x).— This is about the only drug in addition to those recommended by Hahnemann, that has earned any distinction in the treatment of cholera. It is recommended by Dake for the diarrhea when the stools are quite liquid, of brownish or greenish color, attended with great thirst, nausea, or a sense of epigastric oppression. It is especially useful in the worst class of cases characterized by great and rapid exhaustion, with terrible distress, difficulty of breathing, and almost total cessation of the circulation.

Carbo veg. (30x).— No reaction; vital forces nearly exhausted; body cold, skin bluish, breath cool; thready, intermittent pulse, cold sweat on limbs.

Bryonia (3x) and **Rhus tox.** (3x) were recommended by Hahnemann when typhoid symptoms supervened. They should be prescribed only in accordance with their usual indications in typhoid conditions.

Consult also *Croton tig.* (3x), *Euphor. cor.* (3x), *Euphorb.* (3x), *Hydroc. ac.* (3x), *Ipec.* (3x), *Jatropha* (3x), *Lauro.* (3x), *Phos.* (3x), *Secale* (2x), *Tabac.* (2x).

CEREBROSPINAL MENINGITIS.

Synonyms.— Cerebrospinal Fever, Spotted Fever.

Definition.— An acute infectious disease, characterized by inflammation of the meninges of the brain and spinal cord. It occurs sporadically, but more often as an epidemic, rarely, but occasionally assuming pandemic proportions. It is a disease of modern recognition, never having been observed before 1805. Since that time many more or less extensive epidemics have occurred, and in this country the disease has become endemic, but at the present time appears to be becoming less prevalent.

Pathology.— The extent of anatomical lesions presented in a given case depends upon the duration of the illness. In those cases which have been rapidly fatal, the individual is so overwhelmed by the poison that the characteristic anatomical changes have had no time to develop. In cases where death has occurred after the disease has been fully developed, there is found in the brain and spinal cord every degree of congestion, from slight hyperemia to an intense inflammation with

serous effusions, lymph deposits, and even collections of pus. The longer the duration of the case, the more purulent is the exudation. These are most constant in the pia mater of both the brain and spinal cord, but may also be more generally distributed. The infiltration is more abundant along the course of the blood vessels and in the sulci. The ventricles may be filled with serum, which is sometimes turbid from admixture of pus. The walls of the ventricles may become softened, and in cases of long standing there may be hydrocephalus. The lesions may involve the sheaths of the cranial nerves, leading to neuritis and perineuritis, resulting in permanent muscular and trophic changes. The lungs, spleen, stomach, liver, kidneys and bladder may be found in various stages of congestion.

Etiology.—Cerebrospinal meningitis may occur at any age, but has a special predilection for children and adolescents. Its predisposing causes are cold, moisture, exposure and defective sanitation. It occurs mostly in northern latitudes, and is most frequent during the winter months, and especially among those who live under unhygienic and unsanitary influences, such as are found in crowded buildings, tenement houses, barracks and prisons. The disease is also favored by depressing influences and bodily fatigue, especially from prolonged, continuous exertion, as in long marches. There is no evidence that the disease may be conveyed by any of the ordinary media of contagium—food, drinking water, personal contact, or fomites. The micrococcus lanceolatus is found in some cases, and is therefore assumed to be the specific cause, but other micro-organisms are also found even more frequently, so that the truth of the assumption must yet be demonstrated.

Symptoms.—The period of incubation is not definitely known. Prodromal symptoms may or may not be present. There may be lassitude, headache, cervical and occipital pains, vertigo, and perhaps nausea and vomiting. These may last from a few hours to a week or more and vary much in intensity. The pain in the back of the neck is most characteristic, but is so like unto the neuromyalgic pains of influenza or even those from a severe cold locating in the muscles, that its real nature is seldom suspected until the onset of the disease. With or without the above symptoms, and with or without an initial chill, the onset of the period of invasion is usually abrupt. In mild cases, and usually in sporadic cases, the symptoms are chiefly lassitude, headache, vertigo, nausea and vomiting, sometimes diarrhea, and usually a slight degree of fever.

In typical cases of usual severity there is a severe chill, moderate fever, violent headache and vomiting. In children the initial symptom may be a convulsion. The temperature rarely rises higher than 105°

F. and then soon falls to from 102° to 104° F. It runs a decidedly irregular course. In some cases, even of moderate severity, there is very little fever. The height of the temperature is, as a rule, no criterion as to the severity of the individual case. In fatal cases there is usually a hyperpyrexia preceding death. In other cases the temperature falls to subnormal, and the patient dies in collapse. The rate of the pulse varies, is erratic, and does not correspond with the temperature. It is of good volume and not very rapid at first, but in bad cases becomes feeble and rapid as the result of increasing debility.

The headache is intense and persistent. Even during sleep and while in a state of stupor the patient moans continually, and by other acts and appearances gives evidence of the presence of intense pain in the head. The headache often involves the frontal and temporal regions, but is most severe in the occiput. After it has been present a few hours, there becomes associated a severe pain in the back, and especially in the cervical region of the spine. The slightest attempt to move the head causes intense suffering, and the spinal pains are similarly aggravated by movements of the body. This finally results in rigidity of the muscles of the neck and back, and muscular contraction may cause backward curvature of the head and even opisthotonos. This may be followed by trismus, which is considered a fatal symptom. Clonic spasms may also occur, but the tonic contraction is most frequent and characteristic. There may be clonic contractions and twitchings of the muscles of the face, and of the muscles of the eye causing strabismus. Muscular tremors are sometimes observed. In children there may be convulsions. On the other hand, instead of the clonic spasms mentioned there may be paralysis, especially of the muscles of the face, and paretic hemiplegia. Either temporary or permanent blindness is met with, and deafness is by no means an infrequent symptom. Delirium is constant and appears early, is often active and maniacal in its character and may rapidly pass into stupor and coma, these being sometimes preceded by a low, muttering delirium. Often there is a sharp cry resembling that of hydrocephalus. In females the mania may be of a hysterical character, and in males it may be erotic with priapism and seminal emissions. Photophobia and intolerance of sounds are not uncommon. Hyperesthesia of the skin is characteristic, the least touch causing exquisite pain. Anesthesia sometimes follows the hyperesthesia.

Vomiting is an early symptom. It may be excessive and very painful, and does not depend upon the taking of food or drink, being doubtless of cerebral origin. In about half the cases there is present the eruption that has given to the disease the popular name of spotted

fever. This may be herpetic or petechial, the latter being more common. Herpes may occur on the lips or face, and even on the trunk and extremities. The petechial eruption may be diffuse or be confined to a limited area. It may consist of petechial spots of varying sizes or erythematous blotches, and sometimes large ecchymoses may appear. Other eruptions, such as urticaria, sudamina, rose-colored spots, pemphigus, and ecthyma are sometimes present, but have no diagnostic value. Gangrene of the skin has been noted, and bedsores are quite liable to occur. There is no typical time of appearance or duration of the eruption in this disease, and as has already been observed, it may be and often is entirely absent. The urine is usually scanty and albuminous, and may contain casts. There may be polyuria. Glycosuria has been observed in some cases.

Late in the disease owing to pressure upon the respiratory center in the brain, there may be slow and difficult breathing, and occasionally in severe cases Cheyne-Stokes breathing. There may be diarrhea, but constipation is the rule. There may be severe abdominal pain. In some cases the abdominal wall is retracted, presenting a "boat-shaped" appearance. One attack does not grant immunity from future attacks, as relapses are common and recurrences not unusual.

Certain recognized atypical forms may occur, especially in certain epidemics. First and most important is the —

Fulminant or apoplectic form, more commonly known as malignant cerebrospinal meningitis. Such cases are characterized by the suddenness and intensity of the cardinal symptoms — the chill, headache, vomiting, loss of consciousness and coma, followed by death within a few hours after the onset. In some cases the duration is longer, but the same malignant character is manifest. There is very little if any fever, the temperature often being subnormal. The pulse is feeble and slow, sometimes reaching 50 or even 40 beats per minute. The breathing is labored. Such cases usually occur at the beginning of epidemics, striking terror to the hearts of the community, but later cases usually lose the malignant character.

The *typhoid form* has already been mentioned. Such cases are usually protracted, and present the symptoms common to a typhoid condition. They frequently terminate favorably.

The *abortive form* begins with great violence, but terminates abruptly after a day or two, leaving the patient convalescent.

The *intermittent form* is characterized by remissions and exacerbations in the fever and other symptoms every day or second day, without, however, the regularity of intermittent fever, the fever more

closely resembling that of pyemia. Typical cases may assume the intermittent features at an advanced stage, and be prolonged thereby.

Diagnosis. — In epidemics the diagnosis is usually easy, though often no doubt cases are pronounced cerebrospinal meningitis that are not. In sporadic cases the diagnosis may be attended with considerable difficulty. However, the abrupt onset, intense occipital pains, vomiting and rigidity, or contraction of the muscles of the neck never occur together in any other disease. The delirium, hyperesthesia and eruption are also characteristic when taken in connection with the first-mentioned symptoms.

At the beginning the disease is often confounded with muscular rheumatism or myalgia, but in the latter it is soon evident that the profound symptoms of cerebrospinal meningitis are not to occur. In mild forms of the disease it may be impossible to positively differentiate. The same may also be said of influenza.

Typhoid fever, and especially the meningeal form of typhoid, greatly resembles the disease, but the onset is slower, the course more protracted and vomiting or severe muscular pains are rarely present.

Tubercular meningitis may resemble this disease, but there is usually a tuberculous history, the onset is not usually abrupt, the neuro-myalgic pains are not pronounced, there is less hyperesthesia of the skin, and no eruption.

Pneumonia is often associated with cerebrospinal meningitis, and it may be impossible to decide which is the primary disease. Meningeal symptoms frequently complicate pneumonia, but in such the cardinal symptoms are less pronounced.

Prognosis. — The prognosis should always be guarded except in cases of a distinctly mild type. Malignant cases running a rapid course usually die, or only recover after a tedious and erratic convalescence. In the ordinary type of the disease the mortality ranges from twenty to seventy-five per cent, in old-school practice, according to the severity of the epidemic. The greatest death-rate is among the cases that occur during the earlier part of an epidemic. The mortality is greatest among infants and young children and in those advanced in years. The prognosis depends upon the intensity of the cardinal symptoms and the extent and severity of any existing complications. Homœopathy has made a record in this disease of which to be proud, the percentage of deaths being less than one third of the number shown in old-school practice.

Treatment. — *General Management.* — The patient should be kept in a quiet, cool, well-ventilated and moderately darkened room. All excitement must be avoided. In epidemics isolation may be a wise

precaution, but I do not consider it necessary. Of course cases occurring in crowded houses, tenements, barracks, etc., should be removed if possible to more favorable surroundings, and under such circumstances it is safest to practice the methods of disinfection usually employed in other infectious diseases. I do not favor ice and ice-cold applications. Hot baths are extremely beneficial when the temperature is above 102.5° F. At the very onset a hot bath will produce a free diaphoresis, and give great relief. The bath should be about 105° F. The patient should remain in the bath about ten minutes and then be taken out, and wrapped in warm blankets. After the sweat that follows, the body should be dried with soft towels and the patient placed in bed between sheets. When the temperature again rises, the bath may be repeated. Hot sponge baths are grateful, and relieve the restlessness and pain. Heat is a far safer and more efficacious remedy than cold.

The diet should be liquid, but nourishing, a semisolid diet being allowed as soon as convalescence begins. Water may be allowed freely. Alcoholic stimulants should not be used except in cases of threatened or actual collapse.

Therapeutics. — The old school depends largely upon opium. It is a reprehensible practice. Neither opium nor any of its preparations should be employed. On account of their depressing influence upon an already overburdened heart, neither Antipyrin, Acetanilid, Phenacetin, nor any of the coal-tar products should be used.

The most successful treatment is the carefully selected homœopathic remedy given in the low attenuations. These are usually:—

During the early stages: Aconite, Belladonna, Gelsemium, Veratrum viride, Cimicifuga and Bryonia.

Later Stages. — For cases where brain symptoms predominate: Belladonna, Opium, Hyoscyamus, Helleborus niger, Apis, Cicuta, Cocculus, Cuprum and Zinc. For collapse: Camphor, Veratrum alb. and Arsenicum. For typhoid cases: Arsenic, Rhus tox., Baptisia, Arnica, Crotalus and Lachesis.

• **Belladonna** (3x).—This is the oftenest indicated and most useful remedy. It is of greatest use in the first stage when its chief characteristics are present: Violent headache, pressure and wild delirium, together with a flushed face, throbbing carotids and bounding pulse. There is also retraction of the head. There may be congested and glistening eyes, vertigo, spasms of facial muscles, distortions, dilatation of pupils, double vision, squinting, photophobia, etc. The head is hot and the feet cold. Muscular pains not marked.

Gelsemium (1x).—This is a most valuable drug. According to Fisher it is the Belladonna of malarious districts. “Rarely of use in cerebro-spinal epidemics occurring in extreme northern districts, it is among the best of remedies for this disease when seen in miasmatic sections or in the lower temperate zone. It is also useful for the local paralyses that follow upon cerebrospinal fever.” Gelsemium is most often required at the first onset of the disease. The symptoms are: Severe chill, followed by high fever; intense pain in the occiput; severe muscular pains in the back and limbs; pulse full, but not rapid; flushed face; feeling of prostration; pupils dilated; dullness of apprehension; some vomiting.

Veratrum viride (Tincture or 1x).—Intense arterial excitement, full, strong, incompressible pulse. Later, rolling of head; vomiting, or face haggard, cold; pulse slow, breathing labored.

Aconite (2x) may be required in exceptional cases, when the disease is ushered in with a violent chill, followed quickly by high fever, intense, dry heat; thirst and restlessness; head hot; full, but compressible and rapid pulse; especially in cases occurring in cold, damp weather from raw winds and exposure and sudden suppression of the perspiration.

Cimicifuga (1x).—Intense pain in the head, more particularly at its base and along the spine, the latter being very sensitive. Rigidity of the muscles of the neck and back, with retraction. Marked sensitiveness of the skin, with circumscribed or diffused muscular soreness. Sleeplessness. Alternate tonic and clonic spasms, night and day. Pain in the back, of a drawing, tensive character, or dull and heavy, with tenderness on pressure. Spasmodic jerkings like chorea.

Bryonia (2x).—Here as elsewhere, Bryonia is of most use when the congestive symptoms are somewhat modified and exudation is about to occur. It is also especially useful when there are pulmonary or rheumatic complications. Dull, heavy pain in the head; retraction of head, with severe pain on motion; soreness of all the muscles; lethargy, with tendency to somnolence and coma. Dickinson has been disappointed in Bryonia when used alone, but deems it valuable in conjunction with other medicines to promote absorption and arrest effusion.

Opium (3x) is indicated if sopor or coma occurs, with slow, snoring breathing; face dark red; eyes staring and glassy, with contracted pupils; pulse slow and intermittent; paralysis of one side.

Nux vomica (3x).—This drug is only useful in those cases where the spinal membranes are chiefly affected, especially if tonic contractions of the muscles are present; muscular contractions, brought on

by touch, sudden shock or emotion, or irritable humor, are relieved by its use.

Cuprum (3x to 6x) is of particular value in infants or young children. The patient lies in a stupor; the eyes are sunken and surrounded with dark rings; there is coldness of the hands, twitching and jerking of the limbs, spasmodic twitchings and distortions of the muscles of the face; the child lies on the belly, spasmodically thrusting the breech upward. Violent fits of dyspnea appear suddenly, continuing for two or three hours, then suddenly disappear; threatening paralysis of the lungs, gurgling noise when swallowing fluids, clonic spasms beginning in the fingers and toes.

Cicuta virosa (3x).—Convulsions with frightful distortions, opisthotonos, frothing at the mouth. The paroxysm is always followed by profound exhaustion.

Hyoscyamus (3x) may be called for in cases where there is great nervousness, low muttering delirium, sleeplessness, or later carphology, grinding of the teeth, involuntary micturition; epileptiform convulsions; pulse small, intermitting, and quick; eyes disturbed or rolling in the orbits.

Helleborus niger (3x) is useful after exudation has taken place, the patient being in a state of stupefaction or insensibility, from which it is extremely difficult to arouse him; head rolling from side to side, and boring into pillows; sudden screams; pupils insensible to light; constant chewing motion of the jaws, grinding the teeth, automatic motion of one arm and foot, sometimes suppressed urine and violent convulsions, face distorted; albuminuria.

Apis (3x).—After effusion with the characteristic symptoms of acute hydrocephalus.

Zincum (6x) is especially useful in very protracted cases when the cerebral symptoms continue and are associated with profound prostration. Frequent attacks of vertigo occur, and the memory seems much impaired. There is severe pressure on the vertex and forehead with a tearing as if the head would burst. Dizzy stupefying headache, vertigo always being prominent. The headache is relieved, if at all, by perfect quiet. Constant motion of hands and feet, rolling and tumbling of the head from side to side. Starting from sleep, uttering piercing cries. Spasmodic twitching of hands and feet.

THE PLAGUE.

Synonyms.—The Bubonic Plague, Oriental Plague, Black Death.

Definition.—An epidemic, contagious disease, characterized by high fever and inflammatory enlargement of the lymphatic glands (buboes).

Pathology.—There are no morbid changes further than the buboes, and the usual tissue changes accompanying high temperatures in general.

Etiology.—The disease is caused by a specific micro-organism, which both Kitasato and Yersin succeeded in isolating during the recent epidemic in India. It obtains entrance through the respiratory and digestive tracts and excoriations of the surface. Its development is favored by unsanitary surroundings, without which it probably would not exist as an epidemic. At present writing there is considerable interest manifest in the quite recent death of Dr. Mueller, of Vienna, and a servant and a nurse from this disease. Dr. Mueller, after studying the disease in India, brought home some of the virus with which to experiment upon lower animals with a view of securing an antitoxin serum. The servant in charge of the animals contracted the disease, and died. He was attended by Dr. Mueller and a nurse, both of whom took the disease, and died, but there seems to be no probability of its farther extension. The exceptional virulence of the infectious poison is quite manifest. Recent investigations seem to show that the rat is the infection bearer of this disease. Certainly the micro-organisms may be thus conveyed, but it has not yet been fully demonstrated that the rat is the only infection bearer—the intermediate host, necessary for the development and propagation of the disease-producing germs.

Symptoms.—The period of incubation lasts from two to seven days, when the patient is at once greatly prostrated, and suffers intense pains in the head, back and limbs, and a dizziness causing him to walk with a staggering gait, as if intoxicated. Following a slight chill fever sets in, the temperature rising rapidly to from 105° to 108° F., or even higher, accompanied by delirium. The thirst is intense, and there may be nausea and vomiting. Petechiæ and ecchymoses occur, and in very severe cases hemorrhages from the stomach, bowels and kidneys. The condition gradually assumes that of a typhoid state. After two or three days, if death has not already occurred, the lymphatic glands become swollen and inflamed. The inguinal and femoral glands are chiefly involved, and less frequently the axillary and submaxillary. The glands may suppurate, or in rare cases become gangrenous, or resolution may take place without suppuration. Coincident with the appearance of the buboes, the temperature falls, and there is profuse perspiration. In rare cases carbuncles may also occur in the lower extremities, the buttocks, or in the neck. The duration of the disease is very brief, unless it be prolonged by extensive suppuration.

Diagnosis. — The course of the disease greatly resembles that of typhus fever, but the appearance of the buboes will settle the diagnosis.

Prognosis. — The prognosis is very grave, the plague being considered the most fatal of all diseases. Death usually occurs on the second or third day, but may take place within a few hours.

Treatment. — Preventive treatment is of most importance: This consists in the rigid enforcement of those hygienic measures usually adopted in contagious diseases, especially isolation and disinfection. According to Kitasato, after recovery the patient is to be kept in isolation at least one month, and those who die should be buried twelve feet deep; or, preferably, cremated. The general treatment of the disease is similar to that of the lowest types of typhus and typhoid fever. The buboes should be treated antiseptically. No opportunity has been had, so far as the writer knows, to test the efficacy of homœopathic remedies.

I would suggest at the onset, *Belladonna* (2x), and later, according to the symptoms, *Arsen.* (3x), *Hepar sulph.* (3x), *Iodine* (3x), *Merc. sol.* (3x), *Mercurius biniod.* (3x), and *Lachesis* (6). For prolonged suppuration: *Arsen.* (30x), *Silic.* (30x), and *Sulph.* (30x)

VARIOLA.

Synonym. — Smallpox.

Definition. — An acute contagious disease, characterized by marked fever and associated constitutional disturbances, and followed by an eruption which passes through the successive stages of papule, vesicle, and pustule, desiccation and desquamation.

Smallpox is rarely seen at the present day except in its modified form (varioid). The disease was formerly one of the most virulent and fatal known, which with its loathsome character rendered it the most dreaded of all diseases. The remarkable change that has taken place in the modification of the disease and its practical annihilation as an epidemic among civilized nations is almost wholly due to vaccination.

Pathology. — The characteristic eruption constitutes the essential lesion of smallpox. This will be fully described under the head of symptoms. Secondary lesions consisting of parenchymatous changes in the liver, spleen, kidneys, and heart are usually found in severe cases.

Etiology. — Smallpox is highly contagious, but the exact nature of the contagion has never been definitely determined, and its specific bacillus, if such exists, has not yet been isolated. It is generally admitted that "there is no contagion so strong and sure as that of smallpox, and none that operates at so great a distance, and certainly

none whose vitality is maintained for so long a period." The contagium is invariably transferred from a previous case and never occurs primarily. It is conveyed by personal contact or through the medium of a third person. It emanates from the exhalations of the lungs, from the skin of the sick and the dead, and from the secretions and excretions. It is carried in the air for long distances, and may remain in bedding, clothes, cabs, and rooms for months and years without losing its virulent properties. The infection may be conveyed by inoculation either with the blood of the sick or with the contents of vesicles and pustules or dissolved dry scabs. It is actively conveyed by the scales and crusts thrown off during desquamation. There is no period from beginning to end when the disease is not contagious, although the stage of suppuration is the most virulent. According to some observers the disease is contagious during the stage of incubation. As a rule one attack gives immunity from a second. Probably the poison enters the system through the respiratory tract by inhalation, and is then carried into the general circulation. •

Most people are equally susceptible to the disease unless protected by vaccination or by a previous attack. In some cases vaccination only protects for a limited time. The average is said to be about seven years, when it must be repeated. In rare instances persons seem invulnerable both to the disease and to vaccination. All ages are attacked though the disease is more prevalent in young people. Even the fetus *in utero* may acquire the disease from the mother, and the child be born with the eruption. During pregnancy and the parturient stage there is an increased liability to the disease. Negroes are said to be more susceptible to variola than other races, and in them it usually shows its greatest mortality. Fear of the disease predisposes to its occurrence and increases the mortality.

Symptoms.—The period of incubation is about seven days when the disease follows inoculation, and about twelve days when following infection by the ordinary means of exposure.

Four forms of variola are described: (1) The discrete; (2) the confluent; (3) the hemorrhagic; and (4) varioloid, or smallpox modified by vaccination or by previous attack.

1. *The Discrete Form.*—This is the form usually observed in ordinary epidemics. The onset is sudden, being ushered in by severe rigor or repeated chills, rapidly followed by high fever, headache, and agonizing pains in the back. In some cases there may be vomiting, and sometimes shooting pains in the limbs. The temperature rises rapidly, usually reaching 103° or 104° F. on the first day, and remaining continuously high until the eruption appears. During this period

the pulse is rapid, full, and hard, the respirations are accelerated, the tongue coated, there is a dry cough, and possibly bronchitis, the throat may be sore, there is more or less complete anorexia, usually vomiting and constipation, sometimes diarrhea. The patient is restless, sleepless, and often there is delirium, which is sometimes very violent. In other cases the patient lies in stupor. The headache is severe, usually frontal, which is marked and characteristic, and which lasts throughout this stage with undiminished severity. The excruciating backache does not lessen during this stage, and the pains in the limbs may be very severe. The spleen is usually enlarged and there may be albumin and casts in the urine. On the second day the so-called initial rashes may appear. These, however, are not characteristic, being present in only from 10 to 15 per cent of the cases. They consist of an erythema which may be diffused and exactly simulate scarletina, or macular, being identical with the eruption of measles. They are dark red in color. Sometimes they are general, but usually they are limited to the abdomen, the inner surface of the thighs, or the lateral region of the thorax and axilla. They thus differ in location from both scarlet fever and measles. They may be associated with petechial ecchymoses. They last but a short time and then fade away.

The stage of invasion is almost invariably of three days' duration. Its severity does not always indicate the future severity of the attack, but in most cases it does.

The *stage of eruption* begins on the fourth day. At this time or a few hours previous the temperature declines rapidly and the constitutional symptoms remit in their severity, especially the headache and backache. Simultaneously with this the characteristic eruption begins to show upon the skin and mucous surfaces, first upon the face, particularly the forehead, the backs of the wrists, and the scalp, and then spreading downward until within twenty-four hours it reaches the legs, which are last involved. The eruption is always most abundant upon the face and scalp, while the hands and fingers are the next most favored seats. The eruption passes through successive stages of development, becoming in turn macules, papules, vesicles, and pustules. It first appears as small, round, slightly raised, pale red spots, soon assuming a dark hue. These greatly resemble measles, but within twenty-four hours they assume a characteristic shot-like hardness, and can be rolled about under the skin. On the second day of the eruption these become elevated and form the typical papule. On the third day, being the sixth day of the disease, the papules become vesicles, each having a depressed umbilicated center, which is well marked just before the pustules are formed. This umbilication is the most characteristic

feature of the eruption. Should these vesicles be pricked, they do not completely discharge their contents, owing to their reticulated character. As the vesicle increases in size, its contents become opaque. On the sixth day of the eruption the vesicles become pustules. The central umbilication usually disappears, so that there result pustules each with a rounded summit surrounded by a zone or areola of inflamed and swollen skin which burns and itches and causes a feeling of distressing tension. The face is greatly swollen and disfigured, the eyes closed by the tumefaction, and the hands and feet so swollen that they appear like balls. With the appearance of suppuration the fever again returns. The temperature rises to from 101° to 105° F. and other constitutional symptoms resume more or less of their former severity. This is known as the secondary fever and shows decided irregularity. The pustules are completely developed on the eighth or ninth day of the eruption and desiccation begins, lasting about three days. The pustules dry up and form scabs and crusts which, falling off, leave pits or scars. These are at first very hyperemic, but gradually fade out and become white. If the true skin has been involved permanent cicatrization results. Desiccation occupies a week or ten days before entirely complete, and is attended by much itching. With the beginning of desiccation the fever again abates gradually, and convalescence begins. The hair usually falls out, but is generally renewed, though in some cases it does not grow again.

The variolus eruption also involves the mucosa of the mouth and pharynx, and may appear on the conjunctivæ and in the nasal cavities. Less often the esophagus and rectum are affected. The larynx, trachea, and bronchi if affected show ulceration rather than the true pustules, and the same may occur upon any involved mucous membrane as a consequence of early maceration of the superficial layers of the mucosa. As a natural result there are manifest symptoms characteristic of the respective locality invaded by the suppurated foci such as dysphagia, coryza, hoarseness, and bronchitis. Laryngeal perichondritis with edema of the glottis may occur, and necrosis of the cartilages, resulting in stenosis, necessitating intubation or tracheotomy, has also taken place.

From secondary infection there may result broncho-pneumonia, sometimes with associated pleurisy, and less often lobar pneumonia. There may also occur albuminuria, but rarely nephritis. Hemorrhagic nephritis may occur, and is always of a serious character, though fortunately it is very rare. Suppurative parotitis, otitis media, and orchitis sometimes result. So also may arthritis. Boils, gangrene of the skin, and erysipelas frequently occur and retard convalescence. During convalescence there may be a post-febrile insanity or paralysis from

peripheral neuritis. Myocarditis and pericarditis sometimes occur, and most rarely endocarditis.

2. *The Confluent form* of smallpox is not atypical, but simply represents an excessively severe infection. It differs only from the discrete form in that the constitutional symptoms are more intense and continuous, and the eruption more abundant and profuse, the pustules coalescing along their edges and thus becoming confluent. The face and hands show a solid, suppurating mass, as well as more or less extensive areas elsewhere. The eruption may likewise entirely cover the mucous surfaces. Such patients present a most horrible appearance, while the stench is intense and almost unbearable to those in attendance. Desiccation takes place very slowly, the secondary fever persisting. All complications are of more frequent occurrence and more serious in character. Pyemia is not unusual. Death is usually preceded by typhoid symptoms—rapid, feeble pulse, diarrhea, prostration, dry, brown tongue, subsultus, and low, muttering delirium. If recovery takes place, it is slow and often interrupted by complications and sequelæ.

3. *The Hemorrhagic form.*—This form is also known as black smallpox or malignant smallpox. In this variety hemorrhages occur into the pustules and from the skin and any of the free mucous surfaces—the mouth, lungs, stomach, intestines, kidneys or uterus. The constitutional symptoms are intense, and the hemorrhages often profuse. In some instances ecchymoses appear in the skin and mucous membranes. Collapse may result, the patient sometimes dying before the eruptions disappear. Death usually results on the fourth or fifth day.

A mild form of hemorrhagic smallpox may occur, especially in weak, debilitated subjects, wherein the case progresses from the first as in ordinary forms, and it is not until the vesicular or pustular stage that blood makes its appearance in the pocks. In such cases, and even in the discrete variety, slight hemorrhages from mucous surfaces may occur.

4. *Varioloid.*—As a rule this variety simply means a mild case, one bereft of all its serious features. It is ordinary smallpox modified by a previous attack or by vaccination. It occurs with irregular severity. In very mild cases the patient can scarcely be called sick, and only an occasional pustule forms. From these cases Varioloid shows every grade of severity up to a mild case of discrete smallpox. But whether mild or comparatively severe for varioloid, it should be remembered that the attack is one of true variola, and capable of propagating the disease in a severe form. Cicatrization seldom occurs and complications are practically unknown.

Diagnosis. — Malignant cases of hemorrhagic smallpox may at the onset closely simulate typhus fever, but in the latter the characteristics of the variolus eruption are absent, and the fever does not remit with the appearance of the eruption. Moreover, both diseases are rare, and occur in epidemics, the presence of which in either case is presumptive evidence. In cases of malignant smallpox where death occurs before the eruption appears, it may not be possible to differentiate until other cases occur to clear up the mystery.

As a rule, the appearance of the shot-like papule dispels all doubt as to diagnosis from all the other diseases. The initial rashes may cause a diagnosis of scarlet fever or measles. The latter is the one disease which most often causes serious errors in diagnosis. The resemblance of the eruption of measles to that of smallpox is unfortunately quite similar, and consequent errors in diagnosis have often resulted seriously through the unwitting encouragement of a smallpox epidemic. Smallpox never presents the characteristic prodromes and catarrhal symptoms of measles. The eruption of measles is not shot-like, and the fever increases after the appearance of the eruption.

Mild cases of smallpox and varioloid present a remarkable similarity to chicken pox. The following differential table is given by Anders: —

Variola.	Varicella.
HISTORY.	
Absence of previous attack.	Same.
Previous or present case in the vicinity.	Traceable to previous or present case of varicella.
Not successfully vaccinated.	Negative.
Occurs at any age.	Almost always in childhood.
Characteristic pre-eruptive stage — rash on the third day.	Eruption not preceded by prodromes.
ERUPTION.	
Appears first upon the forehead, extending downward.	Appears first upon the neck and trunk — no regular progression over the body.
Vesicles uniform in size, umbilicated, and deeper seated.	Vesicles vary much in size, are rarely umbilicated, and are more superficial.
Eruption contains serum, later pus.	Only serum.
Most abundant on face and fingers.	Most abundant on back and lower extremities.
Various stages of eruption observed at points removed from each other.	Various stages side by side.
Pin-prick does not cause collapse of vesicles, being multicellular.	Does cause collapse, being unicellular.

SECONDARY FEVER.

Usually present.

Absent.

Prognosis.—The prognosis of smallpox depends entirely upon the severity of the individual case, the age and condition of the patient, and the complications. A large percentage of discrete cases recover, a less number of confluent, while in malignant hemorrhagic cases the mortality is great, there being few, if any, recoveries. The disease is most fatal in children and old people, in the debilitated, and in drunkards. The disease is very rarely fatal in those protected by vaccination.

Treatment.—*Prophylaxis.*—The most important prophylactic measure is vaccination. Both in ancient and modern times smallpox has been the most devastating of plagues. Within the memory of those now living it has been modified and transformed through the process of vaccination into a disease of such a comparatively mild course and infrequent occurrence that among civilized nations its name no longer strikes terror. Doubtless, if vaccination and revaccination were universally and thoroughly practiced, variola would ere long become extinct. Vaccination has been and is now violently opposed by some on account of the fact that syphilis, tuberculosis, and other dyscrasias have been engrafted upon the system by means of humanized virus from diseased subjects, and blood poisoning has been induced by uncleanly methods. These dangers have been practically overcome by the use of bovine virus and antiseptic methods. At the same time, admitting the claims of anti-vaccinationists, the harm thus wrought fades into extreme insignificance as compared with the beneficial results that have inured to the human race from the practice of vaccination. There is an unknown limit to the protective life of vaccination, varying with different individuals. A person is assumed to be protected when vaccination will not "take," after repeated unsuccessful efforts, even though such person had never been successfully vaccinated, or had been successfully vaccinated very many years previous. During the prevalence of an epidemic, everybody should be vaccinated and revaccinated until no typical result is obtained. Every child should be vaccinated during the second or third year of age at latest and again at puberty, and to insure future protection, revaccination should be practiced every seven years thereafter, and oftener if exposed or if an epidemic threatens. It is altogether probable that vaccination during the first few days of an attack of smallpox will modify the severity of the disease. Vaccination should be performed with bovine virus, and that preserved in capillary glass tubes, sealed at both ends is the best and is the least liable to infection through uncleanness in preparing or handling it. If the humanized

virus be used, it is of the utmost importance that it be taken from a healthy subject free from every trace of syphilitic, tubercular, or other dyscrasia. The operation should be performed under strict aseptic rules. If from uncleanness or from the employment of impure virus, septic conditions, sloughing, ulcers, eczema, gangrene, erysipelas, or other infectious diseases result, they must receive the same character of treatment as if they had occurred from other causes.

All the rules for public quarantine and disinfection that have been mentioned for other contagious diseases, must be rigidly enforced.

Patients with variola should be strictly isolated, and when this is not possible in private homes, they should be taken to a contagious hospital. In this way only can the spread of the disease be prevented. Isolation should be strictly enforced until the patient is entirely well, and the skin and hair absolutely free from crusts and scales. All clothing, bedding and other articles used by the patient should be thoroughly disinfected or destroyed. The attendants, including the physician, should adopt strict antiseptic measures, and the latter should thoroughly disinfect his person and change his clothing before going home or visiting other patients. It is a good plan to wear a long mackintosh buttoned up to the chin while in the sick-room.

General Management. — The room should be large, cool and airy, direct draughts being avoided, and all unnecessary carpets, hangings and furniture should be removed. During the initial stage milk should be the sole diet. When that does not agree, peptonized milk, malted milk, animal broths, beef peptonoids, panopepton, trophonine, etc., may be allowed. Cool drinks may be allowed freely. During the stage of remission of the fever, eggs, toast, etc., may be added to the above diet. During the stage of suppuration the strength must be supported by strong liquid foods and by stimulants if there are indications of exhaustion and collapse.

During the stage of eruption the skin should be kept cleansed by gentle ablutions of sterilized water, after which glycerin or vaseline may be applied. I prefer lanoline. The same application may be made all through the stage of suppuration. If there is much odor, a carbolyzed vaseline or lanoline is preferable. Scratching should be prevented, and the eyes protected, as far as possible, and kept thoroughly cleansed. For the latter purpose a saturated solution of boric acid answers the best purpose. The eyes may be covered by layers of cotton dipped into the same solution. All irritating applications should be avoided. Many local applications have been employed to prevent pitting, but they are useless. The extent of pitting depends upon the depth of the pustules, and therefore can not be controlled. Probably the intensity

and depth of the pustules may be somewhat modified by excluding the light and by keeping them covered with strips of gauze constantly wet with weak solutions of bichloride or of carbolic acid, which also relieves the pain and itching. I prefer, however, the oily preparations previously mentioned. Dickinson recommends the application of carbolic acid paste, composed as follows: *Carbolic acid*, four parts; *Olive oil*, forty parts; finely powdered *chalk*, sixty parts. The paste is applied to the face upon a linen mask with openings for nose, mouth and eyes. Strips of linen will suffice for the arms and hands. The applications may be left undisturbed for twelve hours, when new ones should be substituted. The application should be removed upon the commencement of desiccation.

Another preparation is composed of *Carbolic acid*, five parts; *Olive oil*, forty parts; pure *Starch*, forty parts. Another, *Thymol*, two parts; *Linseed oil*, forty parts; powdered *Chalk*, sixty parts.

During convalescence the patient should bathe daily, using carbolic soap. Complications and sequelæ must be treated by the usual measures according to individual indications.

Therapeutics. — During the initial stage *Aconite* (2x), *Belladonna* (2x), *Gelsemium* (1x), or *Veratrum viride* (1x), may be required according to the indications. *Belladonna* is most often indicated. The symptoms calling for these drugs respectively have already been so often repeated under other inflammatory diseases that they will not be mentioned here.

Medicines seem to be of little avail after the eruption has appeared, much more depending upon proper general management. Nevertheless, well-indicated remedies should be employed. The most frequently used are: *Tartar emet.* (3x), *Vaccinium* (30x), *Rhus tox.* (3x), *Apis* (3x), *Baptisia* (1x), *Arsen.* (3x), *Bryon.* (3x), *Merc. sol.* (3x), *Hepar. sulph.* (3x), *Silic.* (6x), *Thuja.* (2x).

Tartar emet. (3x). — The common practice is to give *Tartar emetic* on the appearance of the eruption, and continue it until desiccation begins. This drug is more homœopathic to the eruption than any other. Ludlam, Hughes and others claim for it an "abortive influence over the variolus process." It is also frequently indicated for pulmonary or gastro-enteric complications.

Vaccinium (30x). — This drug has been extensively used, and has proved of great benefit, according to the testimony of many physicians. Goodno says, "During the Philadelphia epidemic of 1872, the writer treated many cases, using this medicine in a routine manner, in dilutions ranging from the third to the sixth decimal, giving at the same time, in some cases, a few doses of *Belladonna*, *Rhus* or *Tartar Emetic*,

according to indications furnished by special symptoms. The results were quite satisfactory, as among about sixty cases none died, although many deaths occurred in the same neighborhood. These cases were all treated at their homes, and most were in good circumstances, which accounts largely for the absence of deaths."

Variolinum (30x) makes the progress of the disease much milder; quickly removes all dangerous symptoms; changes imperfect pustules into regular ones, which soon afterward dry up; promotes suppuration on the third day, and exsiccation on the fifth, sixth and ninth days and prevents all scars. This is the unanimous testimony of ten physicians who have used it in different epidemics." (Raue.)

Baptisia (Tincture to 2x).—Dr. Williams in the *British Journal of Homœopathy*, says that *Baptisia* proved very effective during an epidemic of smallpox. The disease assumed a typhoid character.

Rhus tox. (3x).—This drug is not only indicated for the early cutaneous symptoms, but is also useful later on in confluent or malignant cases, with livid eruption, dry, cracked tongue, sordes on the teeth, restlessness, muttering delirium and diarrhea.

Thuja (3x).—This drug was recommended by v. Bœnninghausen as a preventive as well as a curative agent. He states that it shortened all cases, and prevented all scars in the epidemic of 1849, in his neighborhood. It is especially useful during the stages of desiccation, desquamation and secondary fever, attended with heat of the surface; itching and stinging of the surface.

Other remedies mentioned are to be prescribed solely on their usual individual indications.

VARICELLA.

Synonym.—Chicken Pox.

Definition.—An acute, contagious disease, especially of childhood, characterized by an eruption on the skin presenting papular, vesicular and pustular stages, and with little or no constitutional disturbance.

Etiology.—This is a disease peculiar to early childhood, and few escape it. Infants and children under five years of age are most susceptible. It rarely occurs after the eighth or tenth year. One attack is usually protective. It occurs in sporadic, endemic and epidemic forms. It is eminently contagious, and can be conveyed by direct contact or through the medium of a third person, but the contagious principle is of a low grade of intensity. Its specific causal organism, if such exist, has never been isolated. It was once sup-

posed to be identical with varioloid, but it is now known that there is no connection, immediate or remote, between these diseases.

Symptoms. — The period of incubation is from ten to fifteen days. The invasion may be attended with no constitutional disturbance, the appearance of the eruption being the first manifestation of illness. At other times there are slight peevishness, restlessness and feverishness. In other cases there may be chilly feelings, followed by a temperature rarely higher than 102° F., except in very young children or unusually severe cases, when the temperature may reach 104° F. In some cases there is lassitude, vomiting and muscular pains in the back and legs. At the end of twenty-four hours the eruption begins, appearing first on the chest and back or on the forehead, face and scalp and consists of small, raised spots, which in a few hours become vesicles, which are transparent and slightly yellowish. The size of the vesicles vary, averaging about as large as a split pea. The larger ones are usually upon the forehead. Occasionally they may be found also on the mucous surface of the lips, inside the cheeks, on the tongue, palate, conjunctivæ and about the genitals. They are superficial, readily collapse on puncture, are rarely umbilicated and seldom show an inflammatory areola. When umbilication is present, it is due only to the fact that the drying up of the vesicle begins at the center. By the end of the third day they begin to dry up, and in another day are converted into dark-brownish crusts. These drop off in from five to twenty days, depending upon the depth to which the skin has been involved. Usually no scar is left, but circular scars may result from the larger and deeper vesicles, and where they have been scratched by the child. The eruption appears in fresh crops during the first two or three days, so that by the fourth day they can be seen in all stages. In about a week they have all disappeared. In poorly nourished or unhealthy children ulceration may follow desiccation, or there may be gangrene of the skin, and hemorrhages may occur into the pustule, sometimes accompanied by hemorrhage from mucous membranes. As the eruption disappears, the temperature gradually falls to normal. Varicella and measles may be associated together in the same patient, and rarely also scarlet fever.

Diagnosis. — The diagnosis is easy. The disease may be confounded with varioloid. See differential table under the head of variola. In some cases it is impossible to distinguish between a mild case of varioloid and a severe case of varicella.

Prognosis. — The prognosis is invariably favorable except where an exceptionally severe case occurs in a weak, puny child.

Treatment. — The child should be isolated from all other children until the crusts have all fallen off. It should be placed in bed and kept there as long as there are any constitutional disturbances, and kept in the house until desquamation is complete.

The remedies usually required are: *Acon.* (3x), *Ant. t.* (3x), *Apis.* (3x), *Ars.* (3x), *Bell.* (3x), *Bry.* (3x), *Ipec.* (3x), *Merc. sol.* (3x), *Puls.* (3x), *Rhus tox.* (3x), *Sulph.* (30x). Goodno considers *Rhus* the most useful remedy, and says it should be given from the first. I rarely find it necessary to go beyond the use of Aconite and Pulsatilla. The former for the fever and restlessness, the latter later on for the gastric disturbances sometimes present.

MEASLES.

Synonyms. — Rubeola, Morbilli.

Definition. — An acute, highly contagious disease characterized by an initial coryza, general catarrhal symptoms, and a maculopapular eruption.

Pathology. — In uncomplicated measles there are no essential lesions exclusive of the eruption, which will be considered under symptoms. If death occurs, it is the result of complications, the lesions of which will be found. These are especially catarrhal pneumonia and nephritis.

Etiology. — Measles is a disease of childhood, but is not uncommon among adults with whom it is sometimes very severe. One attack usually protects from a second, but this is by no means an invariable rule, as there may be a second, a third or even a fourth attack. Children are very susceptible and in an epidemic practically none who are exposed escape, save those protected by a previous attack. Sporadic cases occur but the disease is rarely seen except in epidemics. These are more frequent during the fall and winter months.

The exact nature of the contagium is unknown. No specific organism has, as yet, been isolated. The disease is contagious throughout its course, especially during the eruptive stage, and possibly during the stage of incubation. The poison is communicated by the breath, by the nasal and bronchial discharges, by the desquamating skin and perhaps by the tears. It may also be conveyed by a third party and by fomites. The contagium is more active than that of scarlet fever, less so than that of smallpox, but has less vitality and a shorter duration of life than either one.

Symptoms. — The period of incubation is from seven to fourteen days, during which time the child may show some irritability and feverishness, but as a rule there are no symptoms.

Catarrhal Stage.—The initial symptoms of measles are those of a feverish cold. There is usually some shivering, but rarely a distinct chill. Convulsions very rarely usher in the disease. Very early there is a marked coryza, redness and watering of the eyes, photophobia, sneezing, and a peculiar dry, barking cough, with more or less hoarseness. There may be a catarrhal sore throat and vomiting, but these symptoms are not so common or severe as in scarlet fever. The temperature rapidly rises to 101° or 104° F., remitting somewhat on the second and third days, becoming again elevated upon the appearance of the eruption. On the third day or earlier there may be seen one or more distinct papules on the hard palate. The symptoms of this stage vary according to the severity of the case, from those of a trifling cold with moderate fever to those of a severe catarrhal fever.

Stage of Eruption.—The eruption makes its appearance at about the end of the fourth day, being seen first on the face and neck, and then rapidly spreading over the chest and body. The eruption consists of crops or patches of dusky-red papules surrounded by a zone of erythema. These patches vary in size, and have a tendency to assume a roundish or crescentic outline. The papules impart a shot-like feeling to the finger, closely resembling that felt during the papular stage of smallpox. The eruption develops more rapidly in some than others. It may be fully out within a few hours, while in some cases it requires several days. As a rule, the earlier the eruption appears and the fuller and the more complete its development the better it is for the patient. Usually in from three to five days the eruption has reached its height, and commences to fade first on the face and neck, then on the body and limbs, followed by a fine bran-like desquamation. The fading takes place in the order of invasion. In two or three days the rash is gone, leaving a blue-mottled stain over the body. During the stage of eruption the temperature again rises, usually reaching 103° to 105° F. at the time of the greatest development of the rash, other constitutional symptoms assuming corresponding proportions. With the disappearance of the eruption the temperature gradually falls or drops by crisis, and the cough and other disturbances gradually subside. In case the temperature does not fall with the disappearance of the rash, there is probably some complication, either pulmonic or nephritic in character, usually either a bronchitis or broncho-pneumonia.

In some cases the rash develops slowly, and there is a very high fever (105° or 106° F.) and cerebral symptoms, convulsions, delirium and stupor.

The so-called "black measles" is a malignant form of the disease most often met with in camps and jails, barracks or institutions, and in

savage tribes where measles appears for the first time. This form is also known as hemorrhagic measles, and is characterized by subcutaneous extravasations of blood and hemorrhages from the mucous membrane. The invasion is sudden and intense; prostration is extreme; there are often severe pulmonary complications, and may be convulsions and delirium or even coma. Such cases are very frequently fatal.

Complications. — One of the serious features of measles is the tendency to more or less serious complications, and which may from poor management arise in even apparently mild cases.

The most serious of these is bronchitis or broncho-pneumonia. Catarrhal or membranous laryngitis may supervene, and in rare instances edema of the glottis. Tubercular infection may occur, and be the origin of acute tuberculosis later on. Catarrh of the middle ear leading to suppuration and perforation of the tympanum with consequent deafness, may occur during desquamation. It is claimed that this may be avoided by cleansing the post-nasal spaces frequently during desquamation. A chronic conjunctivitis is of frequent occurrence where proper precautions are not observed, especially in anemic and strumous children. Other rare complications are nephritis, glandular enlargements, cancrum oris, noma pudendi, nervous lesions, and diarrhea, which may assume a dysenteric character. The disease is frequently complicated by whooping cough.

Diagnosis. — In an epidemic of measles the diagnosis is an easy matter, but in sporadic cases, owing to possible irregularities of development, the diagnosis may be attended with difficulty and should not be made without due consideration. In such cases the diagnosis must not depend upon the eruption, but on the catarrhal symptoms — the coryza, the red eyes, the lachrymation, and the peculiar hoarse cough, and also the papules on the hard palate anticipating the general eruption. These are characteristic of measles only, and will serve to differentiate it from variola, varicella and scarlet fever.

Prognosis. — In ordinary epidemics and sporadic cases properly managed the prognosis is almost invariably favorable. Death seldom results except from pulmonary complications. In very young, weakly children, and where the environments are unhygienic and the care and nursing not proper, the prognosis is liable to be unfavorable. In epidemics occurring in camps, hospitals, and foundling asylums, death may be due directly to the disease, and the mortality be very high.

Treatment. — The patient should be isolated in a moderately dark, well-ventilated room, the temperature of which should be uniform at about 68° or 70° F. The old idea that rooms should be kept perfectly dark, hot and without fresh air is obsolete. The patient should be

kept in bed for several days after the fever has subsided and the eruption gone, and not allowed to go out of the room, or the uniformly heated house, until at least one week after desquamation is complete. It should then be carefully guarded from atmospheric changes in order to avoid general respiratory troubles. During the fever the diet should be liquid, preferably milk, and gradually increased as the patient convalesces. Water may be allowed freely. The skin should be bathed with warm water and soap every other day, and if there is much irritation the surface may be anointed with cocoa butter. Great care should be taken to protect the patient from draughts, and the weak eyes from being injured by too early exposure to bright light.

Therapeutics. — In ordinary cases Aconite, Bryonia, or Pulsatilla are the only remedies required. In malignant and atypical cases various remedies may be indicated.

Aconite (3x). — This is the remedy almost invariably indicated in the initial stage. There is a full, quick pulse, dry, hot, burning skin, fever, restlessness, catarrhal irritation from the eyes down into the bronchial tubes, dry, hoarse, or even croupy cough, grating of the teeth, moaning and groaning or sleeplessness, with great agitation and anxiety.

Bryonia (3x). — Dry, painful cough, soreness of the limbs and body, hard headache, hoarseness, oppression of breathing, stitches in the chest. Also when the eruption develops slowly or if retrocession occurs. Broncho-pneumonia.

Pulsatilla (3x). — This drug is indicated if with mild blennorrhoea the gastric symptoms predominate — vomiting, pain in the epigastrium, repugnance to food, tongue thickly coated with a grayish fur, disagreeable taste. The drug is often useful for the catarrhal and purulent ophthalmia that sometimes follows measles.

Gelsemium (2x) may be required instead of Aconite in the initial stage when the fever is moderate, the pulse soft, and instead of restlessness the patient lies quiet and languid, and does not wish to be disturbed. Usually more or less aching in the back and limbs. These symptoms often usher in asthenic cases of a severe character. It is also indicated in undeveloped eruption, with pain at the base of the brain, high fever and passive brain symptoms.

Belladonna (3x) is not as useful in measles as in other eruptive fevers, but may be required in the initial stage. The skin is hot and moist, the pulse full and bounding but compressible, cerebral symptoms, flushed face, injected eyes, sore throat with sense of spasmodic constriction, drowsiness with inability to go to sleep, starting in sleep, convulsions.

Veratrum viride (1x) may be required in the initial stage and with active pulmonary complications. It is chiefly indicated by the very high temperature and intense arterial excitement, full, strong, incompressible pulse.

Euphrasia (3x) is useful where the coryza predominates with an excessively profuse bland discharge from the nose. Hoarseness and dry cough.

Arsenicum (3x). — Asthenic cases. Persistent burning heat of the skin; frequent, quick and small pulse; great anxiety; restlessness; too early or sudden disappearance of the rash; pale, earthy color of the face; bloated face; constant craving for cold water, with but little drinking at a time; vomiting and diarrhea; great sinking of strength.

Kali bichrom. (3x). — According to Farrington this remedy "usually resembles *Pulsatilla*, only that it is *Pulsatilla* much worse." It is often useful later on in *Pulsatilla* cases. There is flowing of water from the eyes, with burning when opening them; pustules on the cornea; stitches in the left ear extending into neck and head, with swelling of the glands; watery discharges from the nose, with great sensitiveness and ulceration of the nostrils; hoarse, dry, croupy cough.

Drosera. — Often of value when there is a spasmodic, dry, hoarse cough, resembling whooping cough. Acts best in low dilutions or the tincture.

Tartar emet. (3x). — This drug is indicated when measles is complicated with bronchitis, with wheezing, rattling respiration, and profuse discharge of mucus; also in capillary bronchitis, with rapid breathing, subcrepitant râles, dyspnea.

Consult also *Allium cepa* (1x), *Anac.* (3x), *Apis* (3x), *Crotal.* (3x) (*Hemorrhagic*), *Ferr. phos.* (6x), *Ham.* (1x), *Hep. sulph.* (3x), *Merc. sol.* (3x), *Rhus tox.* (3x), *Squilla* (1x), *Sticta* (1x), *Stram.* (3x).

RUBELLA.

Synonyms. — Rötheln, Rubeola Notha, German Measles, French Measles.

Definition. — A mild, acute, contagious disease, characterized by a punctiform rash which fuses into patches less markedly crescentic than those of measles. This disease was once supposed to be a variety of measles, but is now known to be an independent and distinct affection. Many so-called second attacks of measles are attacks of rubella.

Etiology. — This disease usually occurs in epidemics which are rare, but may be extensive when occurring in large cities. It occurs mostly in children, but adults are not exempt. The specific causal organism has never been isolated. It is much less contagious than

measles or scarlet fever. According to Edwards, it is spread by the cutaneous exhalations, breath, fomites and clothing, and is probably contagious from incubation until far into convalescence. One attack procures future immunity.

Symptoms. — The period of incubation varies. It may only be three or four days or as long as three weeks. It is usually about ten or twelve days.

The symptoms of invasion are similar to those of measles, but are milder and of shorter duration. In many cases there are no symptoms preceding the eruption. There may be chilliness, moderate muscular pain, mild catarrh, and slight fever, with temperature barely reaching 100° F. Sometimes there is nausea and vomiting, sore throat, and swelling of the glands at the back of the neck. There is usually also constriction over the chest, and a dry cough and bronchitis. These symptoms rarely continue longer than twenty-four hours. The eruption first appears on the face and chest, and then spreads over the body. It may, however, show great irregularity in development, being confined to only one part of the body, or to the roof of the mouth or tonsils. In most cases it is seen on the palate. It consists of small, round, raised spots of a pinkish rose color, which are either discrete or multi-form and confluent, forming irregular patches without the crescentic shape of the eruption of measles. It is of a pale or rosy-red color, the papules being smaller and more numerous than those of measles. In some cases the intervening skin becomes reddened, giving the whole appearance great resemblance to the rash of scarlet fever. In some cases the papules become vesicular and then pustular, which never happens with the eruption of measles or scarlet fever. The eruption lasts for two or three days, and then fades. There is usually a slight branny desquamation, and a slight pigmentation of brownish color after the rash fades, is frequently noticed disappearing after a few days.

During the eruption sore throat is the most constant symptom. There is usually some fever, and the glandular swelling continues. In many cases the eruption is the only symptom. As the eruption disappears, all existing symptoms subside and the patient is soon entirely well.

There are no complications common to the disease, though if the patient is improperly exposed during the course, there may be respiratory or gastro-intestinal troubles developed. Relapses are not uncommon.

Diagnosis. — The diagnosis from measles is sometimes impossible. Usually the mild catarrhal symptoms, the light color of the rash, the irregular shape of the patches and the swelling of the lymphatic glands

will serve to differentiate. The disease often simulates scarlet fever, but the characteristic constitutional symptoms of the latter are not present.

Prognosis. — Under reasonably favorable hygienic surroundings the prognosis is invariably good.

Treatment. — This is purely symptomatic, about the same remedies being required as in measles, and with practically the same indications. The swelling of the lymphatic glands may demand *Calc. iod.* (2x), *Kali iod.* (1x), *Merc. biniod.* (3x). *Rhus* (3x) is more often required than it is in measles.

SCARLET FEVER.

Synonyms. — Scarlatina, Scarlet Rash.

Definition. — Scarlet fever is an acute, infectious, contagious disease, characterized especially by angina and a diffuse scarlet eruption, terminating with desquamation, and with a tendency to cause an inflammation of the kidneys.

Pathology. — There are no characteristic lesions other than those connected with the eruption and the angina. The eruption does not show after death unless there happens to be hemorrhagic extravasation. In malignant cases when death occurs before the eruption comes out, it sometimes appears after death. The throat shows the results of catarrhal inflammation, and there may be ulceration or gangrenous destruction. The glands may be swollen, the muscles in a state of fatty degeneration, and the cells of the kidneys and liver the seat of parenchymatous changes. The morbid condition found from nephritis and other possible complications and sequelæ are considered under their appropriate headings.

Etiology. — The disease is contagious from the invasion until desquamation is complete. The exact nature of the contagion is unknown, and if due to a specific bacillus, this has never been isolated. The poison exists in the exfoliated epithelium during desquamation, in the excretions from the throat and in the blood. It may be communicated by personal contact, by fomites, and through the medium of a third person. The epidermal scales thrown off during desquamation may be disseminated for a short distance through the air, and then be directly inhaled, or adhere to furniture, clothing, or the hair or beard, and be a source of contagion for a long time, even for months or years, the poison possessing extraordinary vitality. The poison may be received into the system by other means than inhalation, as is shown by the fact that it is transmitted through milk, infected dairies having been

known to cause the spread of the disease. The receptivity is not so universal as in measles or smallpox. All are not alike susceptible to the poison, some children and even entire families being exempt, although all have been equally exposed. Epidemics vary greatly in their virulence. Sporadic cases may occur, and are usually of a mild character. Children between the ages of two and ten years are chiefly liable to the disease. It rarely occurs in infants, and after the tenth year becomes less common with advancing years. One attack usually secures immunity from future attacks, but this is not an invariable rule. Pregnant women and those suffering from accidental or surgical wounds are said to be especially susceptible. The disease is most common during the fall and winter months. Scarlet fever and diphtheria may exist together in the same patient, or peculiarities of each may show in the other, but whether any causal relations exist between the two diseases has not been determined.

Symptoms. — The period of incubation is usually from two to seven days, more often the latter. It may in rare cases be but one day, and in still rarer instances ten to fourteen days.

The invasion is abrupt and decided. Usually sore throat and vomiting are the first symptoms. Coincident with these the fever rises rapidly to 104° to 105° F., and the pulse, which is full and hard, from 140 to 160. Sometimes there is an initial chill. In nervous children the disease may be ushered in with convulsions. The vomiting is usually severe. The throat may show only the appearance of a catarrhal angina, or there may be follicular deposits. The face becomes flushed, and often within a few hours there is delirium. In rare cases either the vomiting or the sore throat may be absent.

Eruption. — Within from twenty-four to thirty-six hours, often as early as twelve hours, the eruption makes its appearance. It is usually first seen on the neck and then on the breast and back, and rapidly spreads over the entire body, imparting to it the color of a boiled lobster. It may however appear first on other parts of the body. The thorax and inner surface of the thighs are favorable sites. It consists of a multitude of minute red points, not elevated above the level of the skin. These are surrounded by an erythema which gives a diffuse red appearance to the whole affected surface. The rash readily disappears on pressure, and promptly returns when the pressure is removed. The eruption may cover the entire body, or it may appear in patches separated by areas of normal skin, giving a peculiar mottled appearance. In the more malignant forms of the disease the redness is of a darker or dusky hue, and in the worst of these petechiæ are present. Such cases sometimes suggest measles.

Usually the lips and chin are free from the eruption, and thus present a striking contrast to the surrounding parts. There is usually more or less itching during the height of the eruption. Within two or three days, and when only complete, the rash begins to fade in the order of invasion. By the end of the first week it is entirely gone, and the stage of desquamation begins. With the appearance of the rash the vomiting usually ceases. The appearance of the tongue during the eruptive stage is usually quite characteristic. At first, covered with a thick white fur which, partially clearing, leaves the so-called "strawberry tongue," the papillæ in the tip and edges standing out like shining red pearls above the epithelial coating. In many cases the tongue presents a dry, red, glazed appearance. The temperature remains continuously high during the eruption, sometimes reaching 108° , and the pulse rapid, hard and strong. The fever gradually subsides with fading of the eruption, becoming normal about the seventh day. The angina continues until desquamation sets in, when it disappears. There is usually a mild delirium, sleeplessness and general restlessness. Rarely is there active delirium or convulsions. The urine is scanty, thick, and contains urates, with a small quantity of albumin.

Desquamation. — The desquamation is usually in direct proportion to the extent of the eruption and the intensity of the fever. In severe cases the desquamation occurs in large flakes and in enormous quantities. Sometimes the whole cuticle of the hand or foot comes off in one mass like a glove, and in some cases the hair and nails have been cast off. In mild cases epidermal scales are hardly noticeable. These scales are potent factors in the spread of the disease, and should be carefully collected and destroyed. Desquamation is usually complete by the third or fourth week of the disease. Should fever continue during the stage of desquamation, it is evidence of the probable existence of complications, the possible character of which will be noted later on.

Variations. — The foregoing description pictures the ordinary type of simple, uncomplicated scarlet fever. There are, however, variations from the regular course which must be considered. These variations depend chiefly upon the amount and virulence of the infection.

Mild or rudimentary cases occur in which there is little but the scarlet rash to point to the character of the disease. Even the rash may be scanty, or possibly altogether absent. (*Scarlatina sine eruptione.*) There is usually a slight fever and some sore throat, but no vomiting. Such cases often simulate urticaria, and present great

difficulty in diagnosis, and which often can not be positively established until desquamation is seen, though even that may, in rare cases, be absent. These are mild forms of true scarlet fever, and capable of spreading the disease. They may, and often are, from too early exposure and lack of care, followed by complications, especially nephritis.

Malignant Scarlet Fever. — Malignant cases may be divided into three types: (1) *Atactic form.* This variety is that usually described as malignant, when the patient is at once overwhelmed with the intensity and virulence of the poison so that death follows in from eighteen to thirty-six hours, giving no time for the development of characteristic symptoms. The temperature rises rapidly, frequently as high as 106° to 108° F., the pulse is very rapid and feeble, and there is restlessness, delirium and coma, or possibly convulsions. If the rash appears, it is scanty and atypical, and the skin usually presents a dusky or bluish appearance.

(2) *Anginose Form.* — In these cases the brunt of the poison is centered upon the throat, which is extremely inflamed and swollen, making speech and swallowing exceedingly painful and difficult. There may be a membranous exudate form upon the fauces, the posterior pharynx, the nasal cavities, the trachea and bronchi, the throat presenting all the features of a true diphtheria. There may be sloughing of the throat tissues, and septic processes be established. The necrosis of tissue may involve large arteries and result in fatal hemorrhage. There is much glandular swelling and cellulitis, and the neck becomes enormously enlarged, frequently resulting in abscesses. At first the temperature is very high, 105° to 107° F., but later it remits somewhat, though still remaining high, and the pulse at first very hard and full becomes rapid and feeble, as the septic conditions become more general and profound. The skin usually presents a dull livid color. The urine is albuminous. A purulent discharge takes place from the nose and ears. The patient dies of sepsis. Such cases may die early from the intensity of the infection, and are then included in the Atactic form. It should be borne in mind that the exudate referred to is not diphtheritic, but is due to the intensity of the local inflammation and to the scarlet fever poison. Diphtheria with a true membrane may, however, coexist. Pleuropneumonia and hemorrhagic kidneys, due to sepsis, are found in all these cases.

(3) *Hemorrhagic Form.* — This variety is mostly present in the weak and debilitated, and is usually fatal within two or three days. It is characterized by hemorrhagic extravasations, showing both as

petechial and large ecchymotic patches. There is usually also epistaxis and hematuria. Cerebral symptoms are usually pronounced, and vomiting and diarrhea are common.

Complications and Sequelæ.—The most important and by far the most frequent complication of scarlet fever is acute nephritis. Very few cases occur in which there is not some involvement of the kidneys, even in mild cases. There may be only an insignificant trace of albumin, and no more disturbance of the kidneys than is usually attendant upon acute febrile affections. According to Delafield in most cases the kidneys are involved in one of three ways: (1) by acute degeneration; (2) by acute exudative nephritis; (3) by acute diffuse nephritis. Delafield's differentiation as condensed by Lockwood is as follows:—

1. *Acute degeneration of the kidney*, or parenchymatous nephritis, belongs to the first and second weeks of the disease, and is not different from the degeneration occurring in the course of any severe infectious disease. The urine may be diminished slightly in quantity, and it usually contains albumin and casts in moderate amounts. The course is mild, unattended by constitutional symptoms, and ends in recovery.

2. *Acute exudative nephritis* belongs to the second and third weeks, following either a mild or a severe attack of scarlatina. In *severe* cases the urine is scanty or suppressed; its gravity usually is unchanged; albumin and casts are abundant; there may be blood. There are uremic symptoms—headache, nausea and vomiting, dyspnea, convulsive twitchings. In some cases there is added contraction of the arteries with high tension pulse and disturbed heart action. The patient becomes anemic and the face puffy, the edema frequently becoming general with fluid in the serous cavities. The temperature is raised, and it remains remittingly high during the acute stage of the nephritis. In *mild* cases there may be only moderate changes in the urine; uremic symptoms may be unobserved. The fever is slight or absent. Between these two there are all grades of severity. These cases run about four weeks and usually terminate in recovery, a small proportion only being fatal.

3. *Acute diffuse nephritis* occurs in the third week and during convalescence. It is really a post-scarlatinal nephritis, and may develop after either mild or severe cases. It runs an acute or a subacute course. The acute cases begin suddenly, and resemble a severe attack of exudative nephritis. The subacute cases develop gradually. There is apt to be repeated vomiting, which is always to be regarded with suspicion in a patient recovering from scarlatina. Anemia and dropsy progress slowly. The urine is regularly diminished in quantity, and it contains abundant albumin and casts.

In some cases the primary changes are the first symptoms. In all cases of diffuse nephritis the disease is apt to continue with more or less rapidity, with or without remission, until the death of the patient. In rarer cases the lesion becomes chronic.

Otitis is a frequent complication of scarlet fever, and is often serious, resulting in permanent impairment of hearing or total deafness. It is presumed to be the result of an extension of the inflammation of the throat through the Eustachian tube to the middle ear. This results in the formation of pus and perforation of the tympanum. In rare cases there is destructive suppuration of the mastoid cells. Fatal meningitis or abscess of the brain may result. This condition may occur during the height of the fever, or from taking cold, or other causes during or even after convalescence.

Arthritis, or the so-called "scarlatinal rheumatism," occurs usually during deflorescence. The joints become swollen, red and painful, and present the usual characteristics of acute rheumatism. The wrists and small joints of the hands and feet are most often involved, but the large joints may also be affected. Recovery is almost certain, but suppuration and permanent deformity may result. Pyemia may follow, and result fatally.

Adenitis in a mild form is present in most cases, but in some the glandular enlargement becomes extensive, and results in suppuration, in which vessels may be eroded, and fatal hemorrhage ensue.

Nervous complications occur in rare instances. Among these may be mentioned chorea, convulsions, hemiplegia, and Osler mentions two cases of progressive paralysis of the limbs. He says the history was that of subacute, ascending spinal paralysis, but it is probable that they were instances of multiple neuritis.

Thoracic complications are chiefly endocarditis, pericarditis, broncho or lobar pneumonia and pleurisy. Pneumonia, followed by empyema, may occur during convalescence. Sudden death may result from edema of the larynx or of the lungs, the latter being consequent upon heart failure, the result of dilatation following an overlooked endocarditis.

Diagnosis.—The characteristic symptoms of scarlet fever—vomiting, high fever, sore throat and peculiar rash—render the diagnosis easy in typical cases. In some cases a positive diagnosis can not be made until desquamation is observed. In cases where the eruption does not appear, a diagnosis may be impossible. Often in such instances, nephritis develops, and makes clear the nature of the disease. It is best to regard all cases that have been exposed to the contagion, and have a sore throat, as scarlet fever. Often the throat appears

much like that of diphtheria, but in the latter disease the eruption is not present, and the general course is different. The presence of an epidemic of either disease must be taken into consideration. It must also be borne in mind that these diseases may coexist in the same patient. The absence of the coryza and cough of measles are usually sufficient to exclude that disease.

Acute exfoliating dermatitis resembles scarlet fever during the eruption, but there are no throat symptoms, and the strawberry tongue of scarlet fever is wanting. Drug rashes (belladonna, etc.) may simulate scarlet rash, but they are of short duration, and the constitutional symptoms of scarlet fever are absent.

Prognosis.— In ordinary typical cases that have proper care and nursing the prognosis is almost always favorable, but on account of the possibility of dangerous complications even in apparently mild cases it should always be guarded. In some epidemics the cases are all severe, and the mortality large. Malignant cases are very fatal.

Treatment.— *Prophylaxis.*— The patient should be strictly isolated preferably in an upper room, which should be divested of all unnecessary hangings and furniture. The nurse, whether a member of the family or not, should wear a dress made of washable material, and should never mingle with the family without first changing her dress and carefully disinfecting her person. It is still better to quarantine the nurse with the patient. When desquamation sets in, to prevent the epidermal scales floating in the atmosphere and bearing the contagion, it is advised to anoint the body with some mild oily substance. J. Lewis Smith recommends for this purpose, cosmolin, menthol and carbolic acid, ten grains of each of the latter to one ounce of cosmolin. Vaseline with five per cent boric acid makes an excellent inunction. The body should be then washed and the water containing the accumulated scales treated with 1-1000 solution of corrosive sublimate. The attending physician should disinfect his person before visiting another family. Anders recommends the use of chlorine gas by the following process: "A drachm of powdered potassium is placed in a saucer, and a small quantity of hydrochloric acid added. The dish is then placed on the floor, and the physician stands over the vapor chloride as it arises until it penetrates all his clothing." Formalin is now considered a better disinfectant for this purpose. It is a good plan to generate a little steam in the room by placing a small dish of water over an alcohol lamp or a gas jet. By putting in the water a few drops of the oil of eucalyptus and thymol it gives off a pleasant fragrance, and is at the same time antiseptic. As soon as the patient has recovered, the room should be well aired, and all the contents, such as bedding, clothing, etc., should be either thor-

oroughly sterilized by dry heat or steam or else burned. The mattress used by the patient should be burned. All toys and books allowed the patient during convalescence should be burned. The wall paper should be removed and the walls scrubbed with a solution of corrosive sublimate and then whitewashed or calcimined. The floor and woodwork should be rigorously scrubbed and then painted. I have known of instances where infection took place and the disease was contracted by children occupying a room two years after there had been a case of scarlet fever in it, because the above precautions were not observed. The common method of disinfection, by burning sulphur in the room, is of no value in this disease.

If there is any drug possessing prophylactic virtues, it is certainly *Belladonna*, which has been highly recommended for that purpose. Winterburn says: "No child, in my practice, who has taken *Belladonna* for three days previous to the appearance of the rash has died of the fever." I have made it a habit for years to administer *Belladonna* (2x) three times a day to every member of the family in which I was treating a case of scarlet fever. Arsenic in palpable doses also possesses prophylactic virtue, but it has to be "pushed until it causes slight puffiness under the eyes" for the reason that it is not homœopathic to the infection of scarlet fever. Therefore *Belladonna* is the better remedy to use. Carbolic acid is also considered a prophylactic, given in an attenuation.

General Management.—The sick room should be well ventilated; free from draughts and kept at a uniform temperature of about 70° F. The patient should be kept in bed until several days have passed after the temperature has become normal, and then may be allowed around the room. During the height of the fever the diet should consist of milk only, or milk with beef peptonoids, or malted milk, etc. As the temperature declines, broths, egg white and fruit juices may be allowed. During convalescence in ordinary cases a semi-solid diet may be permitted. Water may be allowed freely. Alcohol should not be given during the fever, but reserved for possible use during convalescence, should prostration or other athenic symptoms develop. In malignant cases alcohol may be required for impending collapse or profound prostration. There is no doubt but that a rigorous milk diet from the beginning to the end of the disease is the best preventive of nephritis, assuming that the patient is properly protected from exposure to cold.

Systematic bathing is an important element in the proper treatment of a case of scarlet fever. The patient should have a sponge bath two or three times every day, according to the height of the fever. Plain tepid water may be used but it is better to put in a little salt or alcohol.

Some recommend using weak carbolized water or a solution of corrosive sublimate 1:10,000. Cool baths and the cold pack are advised by some recent authors, but I can not be convinced that the benefits derived from such treatment overcome the possible serious danger that may arise, at least, from improper handling. In severe cases the wet pack may be administered as follows: Wring out a sheet wet with water of 70°, lay it on a couple of blankets, place the patient on the sheet, and wrap it closely round the body; afterwards wrap the blankets in same manner; leave the patient from one-half an hour to an hour, then unwrap, rub dry, and place in bed moderately well covered up. If the eruption does not appear promptly or retrocession take place after it appears, a hot-water immersion bath at about 100° F. should be employed, and if the desired result is not at once attained the hot bath should be repeated after three or four hours. If this does not produce the desired effect, and the temperature reaches 105° F. or higher, with marked nervous symptoms, it may be necessary to employ the cold pack, or cold affusions. The latter may be accomplished by placing the patient in a sitting position in a bath tub, and gently pouring water from a pitcher over the head and shoulders for one-half a minute to one minute, then rub the patient dry and replace in bed. For this purpose the water should be about 70° F. and gradually reduced if necessary to 60° or 50° F. Ice-bags to the head are also recommended.

The skin should receive daily an inunction of lard, olive oil or cocoa butter in which may be placed carbolic acid, thymol or menthol, about ten grains to the ounce.

The use of oxygen has been highly lauded. Fisher says it is "an adjuvant of unquestionable merit in scarlatina malignosa. I have had most excellent results from its free inhalation in numbers of putrid cases, one of them my own child. It aids in the elimination of carbonic acid gas, burns the debris to a finer ash, rendering it much easier of excretion by the breath, urine and bowels, as also by the skin when it is acting, very greatly and rapidly increasing the amount of urea thrown off, as shown by its presence in large quantities in the urine after the use of this agent. I have witnessed a reduction of two or three degrees in the temperature in an hour, an almost immediate steadying of the heart's action, with corresponding improvement of the pulse and respiration, and quick disappearance of coma and cyanosis. Even where profound stupor has been present I have observed prompt mental improvement from the forcible expulsion of oxygen from a retort directly in the patient's face for half an hour when the sensorium was too benumbed to admit of special efforts at inhalation."

The nose and throat should be carefully sprayed with a solution of hydrogen dioxide, and this followed by benzonol with 5 per cent each of eucalyptol and menthol, used in a vaseline atomizer. This treatment will often prevent an extension of the inflammation through the Eustachian tubes and consequent otitis. If otorrhea be present, the ear should be carefully cleansed with absorbent cotton and then gently sprayed with hydrogen dioxide. If pus becomes pent up in the middle ear until there is great tension of the tympani, the latter must be punctured. After that a boracic-acid solution or hydrogen dioxide should be used frequently. If nephritis occurs, the treatment should be followed as already recommended under the head of acute Bright's disease.

Therapeutics.—**Belladonna** (3x). — The pathogenesis of *Belladonna* presents a perfect picture of a typical case of scarlet fever. It is, therefore, often indicated in mild and ordinarily severe cases and in a majority of cases is the chief if not the only remedy required during the invasion and the stage of eruption. On the contrary, as *Belladonna* does not poison the blood, it is seldom if ever useful in low and malignant types of the disease, where blood poisoning is the chief characteristic. Neither is it the remedy indicated in most atypical cases, even though they be of a mild character. It is chiefly indicated by the smooth, scarlet redness of the skin, sore throat, high fever and cerebral symptoms.

Rhus Toxicodendron (3x). — Next to *Belladonna* *Rhus tox.* is the most often indicated and useful remedy, but contrary to that drug, its chief sphere of usefulness is in atypical cases, where instead of the smooth, shining scarlet efflorescence of *Belladonna*, the rash is rough, irregular, darker in hue, sometimes vesicular, and associated with much burning and itching. There is usually also the characteristic restlessness of this drug, a general typhoid tendency, and there may be swelling of the cellular tissues, and edema and enlargement and threatening suppuration of the parotid or cervical glands. *Rhus* is our most valuable remedy in malignant cases.

Gelsemium (2x) is a valuable remedy during the invasion where instead of the active condition of *Belladonna* the patient, though nervous and irritable, is languid and listless and wishes to be let alone, with frequent but soft pulse, extreme prostration, vertigo, and usually more or less languid aching in the back and limbs. It is chiefly useful in the smooth variety, but when there is an evident asthenic tendency, Winterburn says it "is frequently the right remedy when the eruption retrocedes and all the viscera evidence the presence of the virus."

Aconite (2x). — This remedy may be required at the onset in asthenic cases when with the high temperature and full pulse there are

great anxiety and restlessness. It is seldom indicated after the eruption appears, and is not a generally useful remedy in scarlet fever.

Bryonia (3x) is especially useful when the eruption does not develop well or has been suppressed. There may be a crimson-red face; dry lips; dry, brownish tongue; great thirst, and drinking much at a time; sleep with eyes half open; disinclined to move; pain on moving. It may be useful at any stage of the disease when meningitis, pleuritis or dropsical effusion supervene.

Ailanthus (2x) is a valuable remedy in malignant cases characterized by sudden and extreme prostration, stupor, vomiting, purplish appearance of the skin, especially when there is much swelling both external and internal, throat dusky red, ichorous discharge from the nose, diphtheritic exudations and slowly appearing eruptions.

Ammonium carb. (3x) is an excellent remedy in malignant cases where there is somnolence; dark-red or putrid sore throat; parotitis; external throat swollen, stertorous breathing; involuntary stools with excessive vomiting; body red, with miliary rash, or faintly developed eruption; threatened paralysis of brain.

Apis (3x).—This drug stands midway between *Belladonna* and *Rhus tox.*, but is not so frequently useful in scarlet fever. According to Wolf it is indicated in usual as well as in those grave cases where the blood is thoroughly poisoned by the virus, and the whole nervous system, under its paralyzing influence and the fever, assumes a typhoid character. The eruption is smooth being neither vesicular or miliary. The practical diagnostic indication for *Apis* is the anginose variety of the disease with burning and stinging pains in the throat, and a marked tendency to edema of the pharyngeal tissues and the glottis. It is also useful when there is a marked cerebral irritation; piercing shrieks; rolling of the head; grating of teeth; irregular, slow pulse; urine scanty, albuminuria; nephritis.

Arsenicum (3x) is useful in malignant cases. It may be indicated earlier but most frequently during the later stages. The eruption delays or grows suddenly pale, livid, or is intermixed with petechiæ. Or during desquamation petechiæ appear. The tongue becomes dry, brown, cracked, blackish or smooth as if varnished. The general condition is one of profound adynamia, with great prostration and restlessness, and other typhoid symptoms. Such cases usually die, but *Arsenicum* may prove a saviour, also cases marked by putrid sore throat, scanty urine, fetid involuntary diarrhea. According to Hughes, *Arsenicum* is the chief remedy in post-scarlatinal nephritis.

Arum triphyllum (2x)—Often an excellent remedy in malignant scarlet fever characterized by a discharge of burning ichorous fluid from

the nose, excoriating the nostrils and upper lip. Sometimes the nose becomes ulcerated and the ichorous discharge very offensive; stoppage of the nose without or with profuse yellow discharge, filling the whole nasal cavity and throat; putrid sore throat; submaxillary glands swollen; urine abundant and pale; eruption all over the body, with much itching and restlessness; picking at the nose, lips, and finger nails.

Baptisia (1x).—Malignant cases of a low typhoid type. Eruption dusky red; tongue white with red papillæ, or dry and brown in center with red edges; putrid breath; fauces dark red (Naja); dark, putrid ulcers (Mur. ac.); tonsils and parotids swollen, absence of pain and great prostration; muttering delirium and restlessness.

Camphora (Tincture).—In desperate cases the patient at the onset of the attack, or perhaps on the second or third day, passes into an algid state. The rash refuses to come out, or suddenly retrocedes. The body becomes icy cold all over; the face blue and hippocratic; yet the child will not remain covered. In this collapsed state Camphora may quickly restore the circulation. If it does not do so quickly, it will not act at all, and other remedies must be resorted to.

Carbolic acid (2x).—Malignant cases with a tendency to rapid destruction of tissues; especially scarlatina anginosa. Fisher says "*Carbolic acid* has rendered me most excellent service in profound blood-poisoning types, with impending or confirmed coma, intense fetor oris, general besottedness of the countenance, patient difficult to arouse, otorrhea profuse and offensive, glandular involvement destructive."

Hyoscyamus (3x).—Excessive nervous excitement, restlessness and sleeplessness; loquacious delirium; illusions of the senses; eyes sparkling, red and prominent or utter stupidity; when spoken to, answers properly, but immediately stupor and delirium return.

Lachesis (6.).—Malignant cases, dark purplish eruptions, or none at all, virulent throat symptoms, advanced stages, signs of blood poisoning, great prostration; sloughing ulceration of throat; diphtheritic exudation on tonsils, beginning on left and extending to right; smooth, red, dry tongue; difficult protrusion and trembling of tongue; partial paralysis of muscles of deglutition.

Mercurius biniodide (3x).—As a rule, the mercurial preparations are not very useful in scarlet fever. Fisher says: "They are too prone to promote suppuration of the tonsils, submaxillary or parotid glands, or middle ear. I am inclined to the opinion, too, that suppurative nephritis may follow upon their administration, especially where the glomeruli are already inflamed." The biniodide is useful in malignant cases where there is great swelling of parotids and neighboring glands, and the fauces and tonsils covered with large fetid ulcers,

Muriatic acid (2x). — Only useful in malignant cases characterized by low typhoid symptoms; great prostration; lower jaw hangs down; patient slides down in bed; scanty, dark-red, or purplish eruption, interspersed with petechiæ; feeble pulse; throat livid and swollen, and covered with a grayish-white exudation; putrid breath; sometimes deep ulcers with black bases, bleeding easily, tendency to slough.

Stramonium (3x). — Similar to Belladonna, but the fever is less intense and the nervous symptoms more pronounced, even to convulsions or acute mania. According to P. P. Wells, "The eruption is less bright, shows a disposition to fade or recede, and the urine is small in quantity or its secretion suppressed."

Sulphur (30x). — I have found Sulphur useful only as an intercurrent remedy, especially in scrofulous children, when remedies do not seem to act well. Raue gives the following indications: Rapidly growing red all over, and intensely so, with sopor following soon after the first vomiting; burning heat of the skin; eruption at first bright, soon growing purple, attended with diarrhea, worse in the morning. Cerebral disturbances, with sopor, starting, etc.; bloated, shining red face with white circle around the mouth; dry nose; dry, cracked and red tongue.

Zincum (6x). — Threatened paralysis of the brain, either before, during, or after the eruptive period. It is chiefly useful when the eruption develops slowly and imperfectly, and cerebral symptoms are manifest, or profound exhaustion, with rapid, almost imperceptible pulse. In such cases the patient at once improves if the eruption appears.

For complications consult remedies under respective diseases.

DIPHTHERIA.

Synonyms. — Diphtheritis, Angina Maligna, Diphtheritic Croup.

Definition. — An acute, infectious, contagious, inoculable disease affecting chiefly the mucous membranes of the pharynx and upper-air passages, and characterized by exudative inflammation and constitutional symptoms, and by the presence of the Klebs-Löffler bacillus. The term does not include those cases properly known as "pseudo-diphtheria," in which there is an exudative inflammation simulating diphtheria, but lacking the constitutional symptoms, and the Klebs-Löffler bacillus. This condition is very common in scarlet fever, and is sometimes found in other diseases, such as erysipelas and measles. It should be remembered, however, that a true diphtheria may be present in connection with a case of scarlet fever.

Pathology. — “The *truc diphtheric inflammation* has for its chief pathologic peculiarity the production of a fibrinous exudate. When the inflammation is superficial and of a mild grade, a croupous membrane is produced which can be easily removed from the mucosa, which it covers. Its formation is accompanied by a necrotic process that does not extend below, but practically replaces the epithelial layer of the mucous membrane. In the severer types of the affection, however, the fibrinous membrane infiltrates all the layers of the mucosa, which undergoes necrosis more or less nearly complete. In the severest form the submucous layer may also become necrotic. It is to be borne in mind that the production of the fibrinous exudate in croup or diphtheria is always preceded by coagulation-necrosis of the epithelium. The mucous membrane surrounding the exudate is hyperemic, more or less edematous and the seat of muco-purulent secretions.”

The Pseudo-Membrane. — “Its composition comprises fibrin, pus, disintegrated leukocytes, flakes of necrosed epithelium, bacilli, and sometimes red blood corpuscles. The fibrin has two main sources: (a) ‘The fibrinogen of the inflammatory matter,’ which transudes through the capillary walls; and (b) disintegrated, migratory leukocytes, which form branching fibrillæ. Weigert holds that the inflammatory exudation is coagulated by a ferment derived from the disintegrated leukocytes.

“The Klebs-Löffler bacilli are found, chiefly and in varying relative numbers, in the meshes of the fibrillæ, but also in the granular fibrin and on the adjacent mucous membrane. Frequently other micro-organisms are associated (streptococci, staphylococci, etc.). The membrane presents a grayish-white color, and if croupous in character, can, as before mentioned, easily be removed. When the mucosa is deeply involved, the membrane is thicker, firmer and more adherent, so that its removal entire can not be effected without great difficulty, and without, as a rule, injury to the surface, as shown by bleeding, etc. The character of the pseudo-membrane is affected by the nature of the underlying structure; thus in the pharynx it is firmer and less easily separable than in the larynx and trachea, where a distinct basement membrane is found. (Flexner.) As the membrane becomes older, its color is apt to grow darker, becoming yellow, or even dark brown. It sometimes becomes gangrenous, and softens or disintegrates, with the production of a very offensive, brownish, semiliquid excretion. The advancing edge of the false membrane is usually thin. On the other hand, when the process has become arrested, the edge is apt to look raised or wrinkled, and later it may be distinctly curled up.

“The membrane may extend downward into the ramifications of

the bronchi. In such cases there is apt to be a lobular pneumonia, and this latter condition may occur without extension of the membrane. Occasionally there is a lobar pneumonia. A generalized bronchitis extending to the smaller bronchi is common from the irritation of aspirated substances. In rare cases the membrane has spread into the esophagus and even into the stomach.

“After separation of a croupous membrane, repair consists merely in a restoration of the epithelial layer—a process which is initiated by the fragments of epithelium that remain along the edges of the diseased area, and proceeds centrally. On the other hand, in true diphtheria, with necrosis more or less nearly complete of the mucosa and even the submucosa, sloughing occurs, and the missing structures are replaced by cicatricial tissues.” (Anders.)

The heart is not always involved, but its muscular tissues may be soft, easily torn, and its fibrillæ the seat of an advanced fatty degeneration. Interstitial myocarditis may be present, and ulcerative endocarditis has been frequently observed. The blood undergoes alteration, becoming black and fluid, and there is leukocytosis, which is proportionate to the severity of the disease. The lymphatic glands are usually swollen, but very rarely suppurate, and there is more or less extensive tumefaction of the neck from involvement of the periglandular tissues. The kidneys may be the seat of an acute degeneration, or of an exudative or diffuse nephritis, or more rarely there may be a diffuse granular degeneration of the epithelium.

Etiology.—Diphtheria is at all times endemic in large cities, frequently becoming epidemic. The most virulent epidemics often occur in small villages and in institutions for children. It is essentially a disease of childhood, most cases occurring between the second and seventh years of age. It occurs at all ages thereafter, but the receptivity diminishes each year. Infants are rarely affected, but cases have occurred in newborn babes. One attack does not procure immunity from subsequent attacks. It occurs mostly during the spring and winter months, and in cold and temperate climates. Humidity favors the development of the disease, hence it is more prevalent in damp, cold weather. Damp houses and cellars also favor its propagation. Unsanitary surroundings and bad hygiene are very essential, predisposing factors. Defective drainage, sewage, and cesspools play an important part in causing the disease. Many cases in cities can apparently be traced to sewer gas. Yet it is a fact also that many cases occur where such causative factors could not possibly prevail, as in sparsely settled rural districts and in the homes of the rich, where the plumbing is absolutely perfect and all surroundings purely hygienic. The Klebs-

Löffler bacillus is present in all cases of true diphtheria. It is therefore presumed that it is in all cases the exciting cause of the disease. There are those, however, who still maintain that the bacillus is a result and not a cause of the diphtheritic process. Certain it is that the bacillus is often found in the throats of those not suffering with the disease, but in such cases, immunity may be due to the fact that the soil is not favorable for the development of their effects. Certain states of the system and local conditions of the mucous membrane favor or retard the disease. Weakness and consequent feeble resisting power, or locally, uncleanliness or chronic inflammatory conditions of the mucosa favor the development of the disease. Dr. Arthur Hennig, of Königsberg, holds that the Klebs-Löffler bacillus is not only present in the nose and mouth of healthy children and adults, and in convalescents for months after the cessation of the disease, but that it is also present in follicular angina, fibrinous rhinitis, aphthous pharyngitis, as well as in individuals with phlegmonous inflammation of the skin, who have never had diphtheria, nor have been in contact with diphtheria. He, therefore, concludes that these bacilli are not a specific cause of the disease, and are irrelevant for practical purposes.

The Klebs-Löffler bacillus is described as resembling the bacillus tuberculosis, but is somewhat shorter, and is broader with clubbed extremities. It stains readily, and grows rapidly in proper culture media. The media used by Löffler for clinical purposes is composed of 3 parts blood serum and 1 part neutral or slightly alkaline nutritive bouillon, containing 1 per cent of glucose. The bacilli thrive at the normal human temperature, but are destroyed by high temperatures. They are also destroyed by aqueous solutions of bichloride of mercury (1-8000), salicylic acid (1-2000), and carbolic acid (1-50). They are usually found only in the false membrane, but may be found in the blood and also in the viscera. Anders says they "do not penetrate the mucosa, and hence do not find their way into the lymphatic or circulatory system, but remain at or very near the site of the local changes." The ptomaine of diphtheria has been isolated, and according to Behring, when the patient is inoculated with it, the system is rendered immune. The injection of this ptomaine in animals has been followed by all the symptoms of diphtheria, except the membrane. It is upon these facts that the antitoxin treatment of diphtheria is based. The vitality of the bacillus is great. It may exist for months outside of the body, though its usual habitat is unknown. It is found on toys and other articles months after the existence of the disease. It may usually be found in the throats of diphtheria patients for several weeks after the attack, and is present in the throats of twenty-five per cent of those who have

been exposed to the disease. It is also often seen in the throats of those who, so far as known, have not been exposed.

The bacillus of diphtheria is associated with other pathogenic bacteria, especially streptococci and staphylococci. These penetrate more deeply than the Klebs-Löffler bacillus and are probably responsible for the associated deep-seated inflammations and the suppurative processes so often present.

The infection may be communicated in many ways. The most important and frequent mode of infection is by direct contact of the contagion as it is received from the throat of the patient, by acts of coughing, into the throats of attendants or those near by. This is the reason why physicians and nurses enjoy less immunity from diphtheria than from any other of the contagious diseases. It is therefore obvious that great caution should be exercised during the examination and treatment of diphtheria patients. Infection may also occur from inhaling the air immediately surrounding the patient, where it is contaminated by the patient's breath, but this does not extend beyond a radius of a few feet. The contagion may also be conveyed by fomites, through the medium of child's toys, books, clothing, etc., and in this way may produce the disease at distant places and after an interval of many months. It is believed by many that the disease affects the lower animals, especially the cat, and that it may be communicated by them to children.

Symptoms.—The incubation may extend from one to fourteen days, but it is usually from two to ten days. The more virulent the epidemic, as a rule, the shorter the period of incubation. The symptoms may be divided into constitutional and local. There exists some difference of opinion as to whether the one or the other class of symptoms named, are primary. The generally accepted idea is that diphtheria commences as a local disease, the constitutional symptoms resulting from the local infection. There are those, however, who maintain that the poison of diphtheria may enter the system by inhalation or ingestion, giving rise, first to marked constitutional disturbances before any local signs are manifest. It is my opinion that both theories are correct. Direct contact of the virus may first produce local symptoms, as is usually, but not always the case. Instances are authentically reported, where the disease ran its course without any pseudo-membrane forming either upon the throat or elsewhere, and also in other cases where there were present, violent systemic disturbances, some time before the presence of any local symptoms. In accordance with this view, some writers recognize two varieties of diphtheria, one as constitutional, arising from external sources such as sewer gas, cess-pools, etc., the emanations from which gradually poison the system,

and the other the local or infectious form, caused by direct infection, and in which the constitutional symptoms are those of sepsis due to the absorption of the ptomaines consequent upon the necrosis of the membrane. In recording the symptoms I shall not recognize this theory of the disease, although I am much inclined to favor its acceptance.

1. *Constitutional Symptoms.* — Usually the onset of the disease is gradual and insidious. The child is languid and indisposed, is chilly at times and has some fever, may complain of pain in the head, back and limbs, has more or less digestive disturbance. Altogether the symptoms may not be at all characteristic but resemble completely the advance symptoms of influenza, tonsillitis or pharyngitis. In the course of twelve hours the child complains of a sore throat, and an examination reveals some redness and the presence of the exudate on the tonsils or soft palate. This pictures a typical case of simple tonsillar diphtheria. Unfortunately these symptoms are often prodromal of those of greater severity which are to rapidly follow. The languor passes into a well-marked prostration, which in true diphtheria is always an early and constant symptom, and is almost invariably proportionate to the severity of the case. The fever rises higher, but usually not above 102° to 103° F., though in very severe cases it may reach 104° to 106° F. The temperature is not regular or typical, and cases resulting fatally have been reported where the temperature never rose higher than 100° to 101° F. The pulse, which ranges from 120 to 140 is never very full and strong, but tends early to smallness and weakness. In severe cases adynamia develops within two or three days, the heart's action becomes weaker, the pulse more rapid and weak, and death may result any time from heart failure.

In rare cases termed malignant diphtheria, the above course is absent, the patient being overwhelmed at once with the virulence of the poison. In such cases there may be vomiting and high fever as initial symptoms, though neither are constant symptoms. The toxic character of the symptoms are plainly evident by the cerebral symptoms which are at once manifest, though these are never as severely proportionate to the disease as in scarlet fever. In the less severe cases delirium and other nervous symptoms, save the prostration, are rarely present, but in malignant cases there may very soon arise delirium, convulsions or coma, due to the toxic action of the ptomaines upon the nervous centers. In some cases that begin mildly these symptoms develop later from the cumulative power of the toxin, and from asphyxia; usually dyspnea and cyanosis are present. Frequently an erythematous rash appears about the face, neck and chest resembling that of scarlet fever. It usually fades away in a few hours.

In malignant cases the rash is often purpuric. Other constitutional symptoms resulting directly from the local conditions will be mentioned in connection with the local symptoms.

Local Symptoms.—These vary greatly with the severity of the attack and the locality involved. The severity of the attack does not seem to depend on the amount or extent of the pseudo-membrane, but rather, according to Rotch, upon three factors: (1) the virulence of the bacteria; (2) the local resistance; and (3) the general resistance.

Tonsillar Diphtheria.—This is the mildest and most common form of diphtheria, as already mentioned. The exudate may appear as a false membrane on one or both tonsils, or it may show only in white points at the crypts of the tonsils, resembling in every appearance an ordinary case of follicular tonsillitis. Should these points coalesce, as they may do, the tonsils become more or less covered with irregular white patches. In the more severe cases the tonsils become inflamed and swollen, and present the appearance of a suppurative tonsillitis, the exudate not appearing until after thirty-six to forty-eight hours. In such cases the deeper structures are involved, the constitutional symptoms are more severe, and death may result. It must be borne in mind that even the mild cases are liable to complications and sequelæ, and of still greater importance is the fact that they may cause infection in others liable to give rise to the most severe forms of the disease.

Pharyngeal Diphtheria.—In this form the tonsils also are usually involved, the exudate reaching out and covering more or less of the pharyngeal tissues. The primary inflammation presents, as a rule, a more livid hue than in an ordinary catarrhal inflammation. The exudate first shows upon the tonsils, and soon appears upon the soft palate, half arches and usually on the pharyngeal wall. The structures are often greatly swollen and tumefied, and this extends to and involves more or less the glands beneath the angle of the jaw. The latter become enlarged, hard and painful and the periglandular tissues tumefied. The enlargement and tumefaction is usually in direct proportion to the intensity of the infection. In mild cases the tumefaction may be absent, and the glandular enlargement only slight, but the presence of the latter in any degree when associated with the exudate in the throat and the constitutional symptoms of diphtheria is an infallible proof of the nature of the disease. In mild cases the constitutional symptoms are light, and the patient complains of a raw feeling in the throat. In more severe cases the symptoms are proportionately intense, and there may be pain, increased by talking or by swallowing, muffled voice, fetid breath, and in some cases pyalism. The mild cases are usually convalescent in about a week, the membrane separating and leaving behind a

red, irritable surface. In pharyngeal diphtheria the patient is more or less prostrated for several weeks after the attack. About one fifth of the mild cases are followed by post-diphtheritic paralysis. In severe cases the exudate may extend into either the nasal passages or the larynx, rarely to both in the same case.

Nasal Diphtheria. — Diphtheria originating in the nasal passages is of very rare occurrence. Nasal involvement is almost always due to an extension of the diphtheritic process from the pharynx. In nasal diphtheria there may be no pronounced exudate, but a bloody purulent secretion filling the passages and obstructing respiration. In other cases a pseudo-membrane may be present and entirely occlude the passages. In some cases there is a brown, watery discharge, which stains the pillow and excoriates the lips. Mild cases are reported where a pseudo-membrane existed in the nose, with insignificant general symptoms, and which were pronounced diphtheria for the reason that the bacilli were present. The general symptoms are usually as fully severe as in the pharyngeal form. The glands of the neck are more apt to be enlarged, and usually there is great tumefaction. The diphtheritic process may extend to the conjunctivæ, and give rise to diphtheritic conjunctivitis with either a pseudo-membrane or a muco-purulent discharge. As a rule nasal cases do badly. They may not prove fatal, but are usually slow in convalescence and frequently leave behind a chronic naso-pharyngeal catarrh. Death may occur from sepsis or heart failure, or in very young children from asphyxia or starvation, owing to an inability to breathe and nurse at the same time. In such cases nourishment should be maintained by the use of a stomach tube. When an epidemic of diphtheria is prevailing, all cases of coryza with fever should be looked upon with suspicion and a guarded diagnosis be given.

Laryngeal Diphtheria. — Primary diphtheria of the larynx occurs without the exudate appearing in the throat; usually, however, the laryngeal pseudo-membrane is an extension downward from the pharynx. The first intimation of the laryngeal involvement is a harsh, metallic, ringing cough, and a hoarse, croupy voice, sometimes passing into complete aphonia. The general symptoms are identical with those of membranous croup, except that in the latter there is less adynamia and prostration. Even in true primary diphtheria of the larynx, where the pharynx is not complicated, the last-named symptoms are not so prominent as in diphtheria elsewhere, there being but comparatively slight toxic absorption. Dyspnea is the most striking and alarming symptom, and does not differ from that present in membranous croup. All the accessory muscles of respiration are brought into play. The

alæ nasi dilate, the intercostal and supraclavicular spaces are retracted, and later the lower part of the chest and the epigastrium. Inspiration is prolonged and stridulous. The face is anxious and distressed, and there is an increasing cyanosis. The patient sits up and gasps for breath, bending the body forward and the head backward. Unless soon relieved either by throwing off the pseudo-membrane or by operative interference, the child will die from suffocation or pass into what is termed a masked dyspnea, in which suffocation more slowly but surely succeeds, due to an extension of the exudate downward into the bronchi. In such cases the child no longer struggles for breath, but lies in a relaxed semistuporous condition, the skin becoming cold and the pulse rapid and feeble. Death usually follows in from two to four days. Glandular swelling is not present when the diphtheria is confined to the larynx alone.

Complications and Sequelæ.—*Albuminuria* is present in all cases, and is considered with the presence of the exudate as diagnostic. *Nephritis* is a frequent complication, but there is no edema or anasarca as in scarlet fever. Broncho-pneumonia and capillary bronchitis are comparatively frequent and serious complications. Broncho-pneumonia is very common after tracheotomy, and usually terminates fatally. Otitis media is not an unusual complication. Conjunctivitis is a rare and serious complication, ulcers of the cornea with opacities usually resulting. Local complications, such as sloughing, erosion of arteries, with hemorrhage, and swelling of the neighboring glands, have already been mentioned. The most frequent and important sequela is *paralysis*. It occurs from peripheral neuritis, and may follow either mild or severe cases. It usually is seen in the third or fourth week of convalescence, about ten to forty per cent of all cases being affected. The muscles most frequently paralyzed are those of the soft palate. The first symptoms observed are a regurgitation of food and drink through the nose on attempting to swallow, and a nasal twang to the voice. These may be the only symptoms. It is not unusual to be obliged to feed the patient through a stomach tube. In some cases the voice is entirely lost. If this be due to laryngeal paralysis, there may also be dyspnea and a croupy cough. In rare instances the paralysis becomes more or less general. In such the lower extremities are either paralyzed or are very weak, with an absence of the tendon-reflex, and the muscles of the trunk are more or less involved. Next to the throat paralysis, that of the eye muscles is most common, especially those of accommodation, which is thereby rendered defective. The extrinsic muscles may also be affected, and produce ptosis and strabismus. Frequently there is loss of taste, more or less deafness, and disturbances of sensation. The presence of

paralysis during convalescence is a positive proof of diphtheritic disease. The prognosis in post-diphtheritic paralysis is almost always favorable, but not always, as I have learned by experience. If the cardiac nerves become implicated, paralysis of the heart may occur. In a case recently treated, the patient being over sixty years of age, myocardial weakness developed early, and gradually progressed, the patient dying in about three weeks from heart failure. It is possible also that heart paralysis may occur early in the disease outside of toxic influences, and produce sudden death. Anemia and chronic naso-pharyngeal catarrh frequently follow diphtheria.

Diagnosis.—The diagnosis may be easy where an epidemic of diphtheria is prevailing, but it is frequently difficult in the first cases appearing and in sporadic cases. The most common mistake made is in confounding it with follicular tonsillitis, and often a diagnosis is impossible at first without a bacterial examination. The presence of albuminuria is pretty conclusive but not positive. Usually in follicular sore throat there are evidences of gastric disturbance, the onset is always sudden, the primary fever high, the exudate remaining limited in extent and disappearing in two or three days with a sudden abatement of the constitutional symptoms. No doubt such cases frequently pass for diphtheria, especially with those physicians who pride themselves on reporting a very large percentage of recoveries, and they also go to swell the favorable statistics for serumtherapy. In some cases, however, the mistake is the other way, and serious consequences result from not recognizing the presence of true diphtheria. It is a pretty safe plan to regard all such cases with suspicion until it is possible to make a positive diagnosis.

A differentiation between laryngeal diphtheria and membranous croup is not always possible. The differential points have already been mentioned in considering membranous croup.

There may be difficulty in differentiating from scarlet fever in those cases where a rash develops, and in cases of scarlet fever without an eruption. It may be that a positive diagnosis can not be made until time has been given for desquamation to appear in case it is scarlet fever.

The presence of the Klebs-Löffler bacillus is considered as positively diagnostic of diphtheria. Whether this is absolutely true or not, the general acceptance of it as a fact, makes it prudent to submit all doubtful cases to a bacterial examination. In the country this is not always an easy thing to do, as experts in bacteriology are not easy to find, but in the city there can be no excuse for neglecting it. The larger cities in the United States offer, through their health

departments, to make bacteriological examinations for physicians in all cases of suspected diphtheria.

Prognosis.—Diphtheria is the most prevalent and most fatal of all the common diseases. The prognosis is always grave. Even very mild cases may become severe, and if they do not, may give rise to fatal complications or sequelæ, though not to the same extent as in scarlet fever. The danger of heart failure is to be considered in all cases. The prognosis depends upon the virulence of the epidemic, the age of the child, and the locality and extent of the lesions. The younger the child the more unfavorable the prognosis, the strong and healthy doing no better than the weakly, and often apparently not so well. As to locality, the prognosis is more unfavorable in nasal, laryngeal, pharyngeal and tonsillar cases in the order mentioned. Excessive albuminuria, partial or complete anuria, much glandular enlargement, vomiting, a necrotic condition of the throat, a sudden fall of temperature, and an irregular pulse are unfavorable symptoms. It is claimed that the use of antitoxin has reduced the mortality to one half the former rate. There are those, however, who deny the truth of this statement, in spite of apparently convincing statistics.

Treatment.—*Prophylaxis.*—The patient should be carefully isolated, and all instruments and utensils used in the sick-room should be frequently sterilized or treated with a solution of carbolic acid. The physician and nurses in attendance should frequently wash their hands, and finally rinse them in corrosive sublimate solution 1-1000. It is a safe plan for the nurses and members of the family, especially the children, to spray their throats two or three times a day with hydrogen dioxide or some mild antiseptic solution, such as listerine, borolyptol or zymocide. The teeth should be cleansed each day with a similar preparation. A frequent gargle with dilute alcohol is also recommended. No milk or food should be allowed to stand in the sick-room.

After isolation is ended, which should not be until the exudate has entirely disappeared, the room and contents should be fumigated with sulphur. After fumigation, the clothing, bed linen, etc., should be hung in the open air for several hours, or, better still, be subjected to boiling in a two-per-cent carbolic solution. The walls and the floors should be washed with 1-10,000 bichloride solution. The health department of the city of Chicago now employs Formaldehyde for disinfecting, using a forty-per-cent solution which is sprinkled upon sheets previously hung up in the room. The room is then closed for five hours. Formaldehyde is a more effective germicide than Sulphur, and has the advantage of not injuring the contents of the room, all of which

except the mattress on the bed are thoroughly disinfected without further process.

Hygienic Treatment.—The patient should be placed in a light, well-ventilated room in which there are no stationary wash-stands or other sewer connections, and should be kept in bed throughout the attack and in severe cases until late in convalescence, on account of the danger of heart failure. The temperature of the room should be about 75° F., and the air should be kept moist. The diet should consist of milk exclusively, either plain or peptonized, the latter being especially desirable in young children, and in those cases where there is considerable disturbance of digestion. When milk does not agree, malted milk or some similar preparation may be substituted. Late in the disease when the strength must be supported, concentrated broths, meat juice, panapepton, trophonine, milk punch or raw eggs should be given. Fruits may usually be allowed. Orange juice, pineapple juice, scraped apple or pear, or grapes without the seeds or skins, are both grateful and beneficial. It is important that nourishment be kept up. The greater the prostration and the more profound the general symptoms, in which the child is prone to refuse food, the more necessity is there for keeping it up. In such cases either gavage or rectal alimentation must be resorted to, the former being most desirable. In case of pharyngeal paralysis no solid food should be allowed until the muscles are fully restored.

As soon as symptoms of systemic depression are manifest, alcoholic stimulants should be given. Many give alcohol from the onset of the disease, but I do not consider this wise except in those cases where the depressing effects of the diphtheria poison are shown at once. Even here the fact should be recognized that the first effects of the poison may produce temporary depression from which the system will react as it becomes accustomed to the poison. Stimulants are unnecessary under such circumstances, and if administered, put the system in such a condition that they do no good when the time comes that they are really needed. The quantity given must be regulated according to the age of the patient and the virulence of the poison. Usually from one half an ounce to six ounces of whisky or brandy well diluted may be given in the course of twenty-four hours. When the stomach is very irritable, champagne may answer a better purpose. Fisher in his "Diseases of Children" voices the sentiment of many physicians in opposing the use of alcoholic stimulants. He says: "I am opposed to its use, and for other than sentimental reasons. I have not found it useful in this or any other disease to any considerable degree, while, on the other hand, I feel convinced that its use encourages nephritic complications

and sequelæ, and that it is responsible for many cases of neuritis, heart failure and paralytic states. Perhaps stimulants should not be tabooed altogether; but to rely upon them indiscriminately in a general way is empiricism of the worst sort, and calculated to result in a neglect to properly adjust nourishment and medicines to individual cases. Stimulants seem necessary in cases of threatened heart failure, especially those dragging along with slowing, irregular and feeble pulse, and it may be that alcohol in some form is the proper stimulant when one is needed; but I am strongly impressed with the conviction that hot milk; hot, thin gruels, and other nourishments easily absorbed, will serve a better and more lasting purpose." Strychnia in from $\frac{1}{30}$ to $\frac{1}{60}$ grain doses may be used as a temporary stimulant, either internally or hypodermatically, where there is danger of immediate death from profound prostration or heart failure.

Local Treatment. — External local treatment is of little value. Sometimes when the glandular swelling is great, hot poultices or fomentations give the patient some relief. The local treatment of the diseased membrane is of the utmost importance, especially in cases caused by direct local infection in which many times early and persistent local treatment has prevented systemic poisoning. At the same time any heroic measures, such as swabbing, etc., are unnecessary and harmful, and can not be too strongly condemned. The use of mercuric bichloride locally in the throat in the form of a spray is both useless and decidedly dangerous. I know of an instance where a whole family of children died presumably from diphtheria, but undoubtedly from direct poisoning with bichloride of mercury used in local treatment. According to my own experience, there is no local agent so generally beneficial as hydrogen dioxide, especially in the early stages. I use it full strength; Anders recommends it diluted one to six of water. He considers it "the very best local application for pharyngeal or nasal diphtheria." It is also the best preparation to use in the nose in the form of spray, to keep the passages cleaned, often thus preventing an extension of the disease to the nasal cavities. Often it is better to administer the hydrogen dioxide in the form of a douche by means of a fountain syringe, using a warm solution of about one to four of water. After necrosis of the membrane has begun, and the breath is exceedingly foul, the permanganate of potash will answer a better purpose. I generally use a weak solution in the form of a spray. Goodno uses this drug from the beginning. He considers sprays of little use, and recommends a trituration of the drug in the strength of one grain to the ounce, in a mixture of fine sugar of milk and gum acacia, blown over the affected parts every few hours. If the nose is involved, he tunnels out a passageway

with cotton and forceps, using cocaine if necessary, and then blows the permanganate trituration into every accessible portion of the nasal chambers. He says this application may be preceded by a spray, compounded of equal parts of peroxide of hydrogen solution and water.

Dr. C. T. Hood, of Chicago, considers that sprays, swabs, or douches do not sufficiently come in contact with all parts of the membrane. He uses the following mixture:—

Hydrarg. Chlor. Cor	grs. ss. to grs. ij (or instead)
Acidum Carbolicum 95 per cent.	gtts. xij
Potassii Chlor.	ʒij.
Tr. Myrrh.	ʒj.
M.—Add, by grinding or triturating pure	
strained honey.	ad ʒiv.

It should be put into a large-mouthed bottle or glass jar. "The patient is compelled to lick the honey off a spoon and is given nothing afterward. He can not swallow it, for every effort to do so only brings the sticky honey in contact with every part of the tonsil, uvula, pharynx, and, to a great extent, the posterior nares. When the membrane is in the nose, a swab of cotton is made on a straw, saturated with the honey solution, and the membrane kept covered with it."

This mixture is given every fifteen minutes up to every four hours, depending upon the case. When the Merc. cor. is used, it may be followed by carbolic acid after the fetor lessens and the membrane begins to slough. If the taste is objected to, add a few drops of winter-green. As soon as the edges of the membrane begin to slough and the body of the exudate to loosen, hydrogen peroxide may be used, but should be "used pure and as a gargle, or with a syringe, but never with the spray." This can also be used in the nose. In the throat, however, Dr. Hood prefers pure chlorine gas, made in the following manner:—

Into a two-ounce bottle put one drachm of chlorate of potash, to which add twenty drops of C. P. nitric acid, using a rubber cork; when the gas has formed, add equal parts of distilled water and simple syrup. If the mixture be correctly made, it will be of a dark-green color. Give a teaspoonful of this every two to six hours; it will very materially help in the loosening of the membrane and in its expulsion. In the treatment of the nose, if it can not be well wiped out with the honey mixture, use cocoa-butter pencils, four inches long and one fourth of an inch in thickness, containing each twenty grains of boracic acid and five drops of ninety-five-per-cent carbolic acid; these are placed up the nostril and allowed to dissolve. If the membrane shows itself in any other locality, treat it in the same manner. When the membrane is

in the nose, Dr. Hood uses chlorine water, U. S. P., diluted one half with warm water and administered by means of a small hard-rubber syringe. Dr. Hood claims great success for this method of treatment, and believes that it will save a large percentage of cases when thoroughly and properly applied.

Papoid will dissolve the membrane, and has been extensively used. It may be applied on a swab, by insufflation or by gargling a hot-water solution. Several grains should be used at each time.

In laryngeal diphtheria it is a good plan to have the patient constantly inhaling a vapor of slacking lime, by means of an improvised tent or canopy. At all events, if the lime is not used, the atmosphere should be kept moist by forming a tent, and allowing the nozzle of a steam kettle, kept over a Bunsen burner or gas jet, to be inserted under it, or the steam conveyed to the tent by means of a rubber tube. When obstructive dyspnea and cyanosis become manifest, the question of intubation or tracheotomy must be considered. The former should be first resorted to, leaving the more dangerous operation of tracheotomy as a last resort.

Antitoxin Treatment. — This treatment is based upon the alleged discovery "that animals may be rendered immune to diphtheria, and that the blood of an animal so treated, when introduced into another animal, protects the latter from infection by the diphtheria bacilli," and that "the use of the blood serum of the lower animals, artificially rendered immune against diphtheria, has a powerful healing influence upon diphtheria, that has been contagiously or spontaneously acquired by man." The value of this treatment is not fully established, though the preponderance of opinion and statistics are in its favor. We must, however, make allowances for the imperfect and often unfair methods by which favorable statistics have been gathered. At the same time, we should, in forming our opinion of the usefulness of the antitoxin treatment, give due consideration to the contrary opinions and statistics as expressed by many prominent clinicians throughout the world, many of whom being at the head of large hospitals, are in a position to judge fairly and accurately. Dr. Martin Deschere, of New York, in an exceptionally able paper read before the Homœopathic Medical Society of the State of New York, in 1898 (*North American Journal of Homœopathy*, November, 1898), presents some of these statements and opinions, and justly argues that such conflicts with oscillating praise and disapproval, "neither recommend nor condemn any remedial agent for the homœopathic physician; they simply call his attention to the fact that a new remedy has been employed in an empirical way, from which some good may be derived, when investigated within

the range of the law of similars." He then proceeds to claim that "*the serum treatment is a method of cure governed by the law of similars, no matter whether such a fact is admitted or not, no matter whether the drugs employed are called nosodes or antitoxins.*" He then attempts to answer the question as to what conditions and symptoms of the patient indicate antitoxin, and concludes that "the useful sphere for this remedy is in the beginning of the uncomplicated Klebs-Löffler diphtheria, free from all admixture of other forms of bacteriæ, where the exudation is abundant from the start, and especially, where a tendency prevails for the invasion of the respiratory organs. In all other complications, as well as in mixed forms of diphtheria, antitoxin will not only be useless, but it may hasten a fatal termination. For such cases, which occur in abundance, another properly selected homœopathic remedy will be a much safer guarantee." The very class of cases, however, that are excluded by Dr. Deschere are included in many of the reports of cures made with antitoxin by homœopathic physicians and others. Whether or not Dr. Deschere's views will ultimately be sustained by practical experience can not be foreseen. I should rather look upon antitoxin as a direct antidote to the diphtheria poison, and as such use it in well-pronounced cases as an adjunct to homœopathic treatment, but in no case to wholly supersede the constitutional remedies pointed out in the homœopathic materia medica, which have justly earned their place in the treatment of diphtheria long before antitoxin was discovered. There are several reliable preparations of serum upon the market, varying somewhat in their strength. The New York City Department of Health furnishes the serum in five strengths. Each vial contains one dose. The dose required varies with the duration and severity of the case, and measured in antitoxin units is between 1,500 and 3,000 units (Behring's standard). The more concentrated the preparation of antitoxin, that is, the larger the number of units to each c.c. of the serum, the more desirable is the preparation. One thousand units are sometimes sufficient when the cases of diphtheria are mild, and the remedy is administered within the first twenty-four or thirty-six hours of the disease, but ordinarily 1,500 units or more are required. Fifteen hundred units may be considered the average curative dose; but in very severe cases, and especially in croup and in cases when the treatment is not begun in an early stage of the disease, the initial dose should be 2,000 or 3,000 units. In cases in which marked improvement does not follow the first dose, the remedy should be administered a second or third time, depending upon the symptoms, at intervals of from twelve to twenty-four hours. Some-

times 6,000 units or more are required in a single case. The remedy is administered by deep hypodermic injections, a syringe somewhat larger than a hypodermic syringe being preferably employed for the purpose, although with the strongest preparations of the serum, in which only small quantities are required, an ordinary hypodermic syringe will often answer. Some point on the anterior surface of the body should be chosen for the injection, as the anterior surface of the abdomen or thorax, or the outer surface of the thigh, where there is an abundance of subcutaneous cellular tissue. Before the remedy is administered, the skin should be carefully washed with alcohol or some disinfecting solution. The syringe should be thoroughly sterilized. The serum is rapidly absorbed, and it is better not to employ massage over the point of injection.

The earlier in the case antitoxin is used, the more certain and rapid are its effects, its advocates claiming that in no instance does it fail when administered within twenty-four hours. On the other hand, the idea that it is of no service when used late in the disease, is not correct. It was the observation of the last class of cases, where antitoxin at the last moment proved a veritable savior in otherwise utterly hopeless cases, that forced the writer to admit the efficacy of the treatment, in spite of previous strong convictions to the contrary. As regards the general and indiscriminate use of antitoxin as a prophylactic, I am convinced of its great harmfulness, and am quite well assured that its evil influences many times more than outweigh its possible usefulness. I should only use it in the presence of a very malignant class of cases, and not at all in an epidemic of tonsillar diphtheria. In the latter, it is much safer to wait until its administration becomes a necessity, if that time ever comes, which with proper local and constitutional treatment is ordinarily not to be expected. When used for the purpose of immunization in those who have been exposed to the disease, 150 to 300 units are used, according to age. This protection is supposed to last from four to six weeks.

Therapeutics.—In the early stages and for mild cases the following remedies are usually required: *Belladonna*, *Mercurius iodatus*, *Nitric acid* and *Phytolacca*.

In severe and malignant cases: *Ailanth.*, *Ammon carb.*, *Apis*, *Arsen.*, *Arsen. iod.*, *Arum triph.*, *Baptisia*, *Canth.*, *Carb. acid*, *Chin. ars.*, *Crotal.*, *Kali chlor.*, *Lach.*, *Lycop.*, *Merc. bin.*, *Merc. cor.*, *Merc. cyan.*, *Mur. acid*, *Rhus tox.*, *Sulph. acid*.

In laryngeal diphtheria: *Ammon. caust.*, *Bromine*, *Iodine*.

In post-diphtheritic paralysis: *Gelsem.*, *Caust.*, *Alum.*, *Plumb.*, *Lach.*, *Zinc. phos.*

Ailanthus (Tincture). — Malignant cases, especially in connection with scarlet fever. Characterized by sudden and extreme prostration, stupor, vomiting, purplish appearance of the skin; throat livid, swollen, dark red, almost purple. Tonsils swollen and studded with patches or deep ulcers oozing a fetid discharge; cervical glands swollen and sensitive to touch; greenish, purulent discharge from the throat.

Apis (3x). — Great prostration from the beginning; bright-red color, and puffy, glossy and varnished appearance of fauces; membrane dirty, gray, tough; uvula edematous; puffiness of the mucous membrane; burning, stinging pains in the throat; absence of thirst; dysphagia; urine scanty or suppressed and highly albuminous. According to Lilienthal, Apis is useful when there is a tendency to heart failure, and in diphtheritic croup, with rough, hoarse voice and sensation of rapid, edematous swelling of the lining membrane of the air passages.

Arsenicum (3x). — This is one of our most important remedies, especially in the later stages of malignant cases where the systemic infection is great and characterized by great prostration and putridity. There is great restlessness; feeble, quick pulse; constant desire for cold drink, but taking little at a time, or better from drinking hot water; all symptoms worse after midnight. Gatchell remarks that Arsenic "is not related to the diphtheritic process, but to the toxemia, due to secondary streptococcus-sepsis.

Arsen. iod. (2x). — Symptoms similar to those of arsenicum, with more involvement of the glands, which are much enlarged and indurated. The membrane may cover the entire fauces to the outer lips.

Arum triph. (1x). — Malignant cases characterized by acrid, ichorous discharges from the nose and mouth, excoriating the skin wherever coming in contact with it; lips sore and swollen, skin peels off; patient continually picks at lips and nose, making them bleed. Sometimes the nose becomes ulcerated, and the ichorous discharge very offensive.

Baptisia (Tincture to 2x). — Stupor and drowsiness; mind wandering; low muttering delirium; restlessness; dusky-red face; fauces dark red (Naja); dark, putrid ulcers (Mur. ac.); tonsils and parotids swollen; absence of pain, and great prostration. An invaluable remedy in typhoid cases. Is sometimes prescribed as a routine remedy in all cases, but not by good prescribers.

Belladonna (3x). — Only useful in mild cases and in the early stage before exudation has taken place. Belladonna does not poison the blood, and is therefore not useful when that condition exists. There is a high temperature, great dryness of the fauces; parts bright red; worse on right side; great pain on swallowing, worse when swallowing liquids; cerebral symptoms,

Bromine. — Laryngeal diphtheria with much constriction and paroxysms of suffocation. Chiefly indicated by a hoarse, croupy cough with rattling in the larynx. Bromine is often administered as an inhalant with satisfactory results in the relief of the dyspnea. A few drops should be placed in a spout vessel of boiling water, and the patient inhale the vapor.

Carbolic acid (2x). — Low adynamic condition. Great putridity of exudate, which is present in large quantities, and is loose and easily detached. Marked absence of pain, and great prostration.

Gelsemium (1x). — The chief remedy in post-diphtheritic paralysis, the tongue, throat and larynx being mostly involved; local tingling; surface anesthesia; defective or impaired vision; seldom indicated during the course of the disease itself.

Iodine (2x). — Laryngeal diphtheria. Similar to Bromine, with less constriction. Great hoarseness and hard, croupy cough, difficult inspiration, etc. Like Bromine may be used as an inhalant.

Kali bich. (1x to 3x). — Laryngeal diphtheria. May be useful in pharyngeal form where the membrane is tenacious, thick and yellow, like wash leather. Exudate extends upward into the nose and downward into the larynx. With the latter, croupy cough and respiration. Shooting pain from throat to ear on swallowing; swollen glands; measly eruption; red, raw, shining tongue; tough, stringy, mucous discharges. "The characteristic difference between Kali bichr. and Mercurius iod. is the more fibrinous consistency of the exudate under Kali, while Mercury has a softer and more pasty pseudo-membrane. I am firmly convinced that, if these remedies were used early and continued persistently our cases of diphtheria would much less seldom progress to the septic form." (J. S. Mitchell, in Arndt's System of Medicine.)

Kali chlor. (1x). — This drug has been extensively used in diphtheria, but not only has it proved insufficient as a remedy, except in a very limited class of cases, but it has also proved to be a dangerous drug on account of its action upon the kidneys, where it tends to the production of nephritis, which in many instances has proved fatal. Its chief indications are: breath very fetid; violent pain in the throat; exudation grayish-white and tending to increase rapidly; gangrenous spots, ulcers with foul secretions. The submaxillary glands are swollen, and the throat red and edematous. Dewey considers it "one of the best remedies to prevent extension to the nasal mucous membrane."

Kali mur. (6x). — "The indications for this remedy rest on a clinical basis, and it is one of the legacies of Schüssler to homœopathy. That it is a most excellent remedy and deserving of a high place in the treatment of diphtheria cannot be doubted by anyone who has ever

tried it. The only indications we have are pain on swallowing and white deposit in the throat, but numerous well-marked cases of the disease have been treated with the remedy, and symptoms like prostration, thick exudation over the tonsils, and entire soft palate, fetid breath, etc., have entirely disappeared." (Dewey.)

Lachesis (6.). — This is a most valuable remedy in malignant diphtheria of the most virulent type, where profound blood poisoning is the predominating feature. The chief indications are a purplish, livid appearance of the throat and extreme prostration. Asthenia is marked from the beginning, the pulse feeble, heart action weak with a tendency to cardiac failure. The left side is most often affected, or beginning on right side and going to left.

Lycopodium (6x). — I do not consider this remedy homœopathic to diphtheria, and have had no success in its use. It is said to be useful when there is stoppage of the nose, great dryness of the throat, ichorous discharges from nose; tongue protruding; begins on right side.

Mercurius. — The various preparations of Mercury enter largely into the treatment of diphtheria, and, as a class, very closely simulate the diphtheritic process in both benign and severe cases. Dewey says: "The mercurial preparations generally have very little, if any, relation to the diphtheritic process, and their efficacy in the disease is a matter of doubt. They may be indicated, however, by bilious, glandular or other symptoms. Mercurius does not produce the sudden and intense prostration of diphtheria. *Mercurius vivus* and *Mercurius solubilis* are never indicated in this disease." He later on says that "the iodides of mercury are sometimes of use," and that the *Mercurius cyanatus* "is one of the best remedies in diphtheria that we have." The iodides are the preparations of mercury most frequently employed. The protoiodid (3x) is most useful in mild cases of tonsillar diphtheria with little glandular enlargement — just that class of cases where a diagnosis from follicular tonsillitis is difficult. Usually the base of the tongue is covered with a thick, dirty-yellow coating, the tip and edges red; right side of throat most involved, or beginning on the right side. It is never useful in malignant forms of the disease. The *biniodid* (3x) is useful in more severe cases when there is great glandular swelling. Left side most affected, or begins on the left side. Deglutition very painful. The *cyanuret* of Mercury (6x) seems best adapted to a grave class of cases when with mercurial symptoms there are associated evidences of profound blood poisoning. It is said to accelerate the absorption of the exudate more effectively than do other mercurial preparations. The case is adynamic from the beginning, and characterized by an early and extreme prostration, very rapid, weak, intermittent

pulse, extensive exudate in the mouth, throat and nose, great putridity and much glandular enlargement. Dewey says: "Clinical experience with this remedy has proved that preparations below the 6th are less effective than the higher, and not as safe, since it produces a tendency to heart failure. The 30th potency seems to have been a favorite one." I invariably employ the 6th trituration, but confess that I have never had the success with this drug that others have claimed.

Mercurius corrosivus (3x) is homœopathic to diphtheria when intense, rapid and destructive in its character. There is not so much putridity or evidences of blood poisoning as in the cyanuret, but the local conditions are equally, if not more, severe. There is nothing especially characteristic in the appearance of the exudate, but the throat is dry, swollen, dark red, with violent burning pains, difficult swallowing, constriction, suffocation.

Nitric acid (2x).—This is an invaluable remedy in both mild and severe cases. It is not used as often as it should be. I know of one physician who lays claim to being an exceptionally good and careful prescriber of the single remedy, but who gives Nitric Acid and Baptisia in alternation in every case of diphtheria with what he considers unusually satisfactory results. There are usually yellowish-white or grayish-white patches on the tonsils and fauces, extending to mouth, lips, nose; swallowing very difficult, as from constriction of the pharynx; submaxillary glands swollen and painful; splinter-like pains. Especially useful when the nose is involved with very offensive excoriating discharge; terrible fetor; intermittent pulse; swollen parotids.

Phytolacca (Tincture or 1x).—Often very useful in mild or moderately severe cases where the throat and fauces are covered with a dirty, dark, pseudo-membrane like washed leather; mucus hawked with difficulty from posterior nares; hangs down in strings; can not drink hot fluids. Severe pains in head, neck, back and limbs; great prostration; faint on rising. Urine often albuminous.

Rhus tox. (3x).—May be useful when characteristic typhoid symptoms are present, and the case characterized especially by extensive swelling of the lymphatics and cellular tissue with threatening suppuration. There is usually mild delirium, stupefaction, restlessness; red, dry and cracked tongue; sordes; epistaxis.

Sulphuric acid (1x).—Bad cases; abundant membrane; drowsiness; liquids escape through the nose; stringy, lemon-yellow mucus hangs from the posterior nares; excessive salivation and fetor of the breath.

ERYSIPELAS.

Synonym. — St. Anthony's Fire.

Definition. — An acute, infectious, specific constitutional febrile disease, characterized by a peculiar inflammation of the skin, more especially of the face, with swelling, heat, pain, redness and a peculiar disposition to spread.

Pathology. — There is a progressive lymphangitis of the entire thickness of the skin and involving the peri-lymphatic tissues by continuity. The changes are those of simple inflammation. The subcutaneous connective tissue may become involved and then suppuration usually occurs. The specific cocci are found in the lymph vessels and spaces especially at the advancing periphery of the inflamed area, and even beyond this margin in the healthy skin. Various changes have been reported as occurring in internal organs; such as granular degeneration of the heart and vessels, the liver, kidneys and spleen. Acute or sub-acute nephritis is sometimes found.

Etiology. — Erysipelas occurs chiefly between the twentieth and fortieth years of age, but may occur at any age. Newborn infants are easily infected. A family predisposition may exist. It prevails especially during the spring months, and is favored by bad hygienic influences. For this reason it occurs in hospitals and institutions where defective plumbing and other unsanitary conditions are present. In such places it was formerly a not uncommon epidemic, but has been largely stamped out by the present perfected methods of sanitation. Its development is favored by the presence of abrasions of the surface, without which inoculation will not take place. It therefore follows surgical operations and confinements, and is liable to occur in old sores and wounds of any character. Persons enfeebled by constitutional diseases, especially Bright's disease, or by intemperance are especially liable to the disease. One attack does not secure immunity from future attacks. Relapses and recurrences are common, and a person once having had an attack of erysipelas is especially liable to subsequent attacks, some being more susceptible than others.

The exciting cause of erysipelas is the streptococcus of erysipelatis of Fehleisen, which is identical in appearance with the streptococcus pyogenes. The same organism has been found in inanimate and decomposing animal and vegetable substances. These organisms act as local irritants, setting up a dermatitis, and this may cause the constitutional symptoms, but the latter are sometimes present before the local symptoms appear. The organisms are found in greatest numbers at

the periphery of the inflamed area which accounts for the peripheral spread of the disease. The original infection always occurs through the inoculation of an abraded surface of the skin or mucous membrane, even though the latter be so minute as to have escaped observation. The contagium may be carried a limited distance in the air, as in the rooms and wards of hospitals. It is also conveyed by fomites, especially by infected instruments and hands.

Symptoms. — Two forms of erysipelas are usually described: (1) Traumatic erysipelas, complicating surgical wounds and injuries, and (2) Idiopathic erysipelas, which arises independently of any apparent traumatic lesion. However, a lesion always exists, but is usually so slight in idiopathic cases as to have been overlooked. I shall only consider the latter form of the disease, leaving traumatic erysipelas to surgical works, where it is quite properly considered.

The period of incubation is undetermined, but is probably from six to fourteen days. During this time the patient may have headache, restlessness, sore throat, anorexia, and some fever. After these symptoms have existed for a few days the patient usually, but not always, has a chill or repeated chills, followed by a temperature of 103° or 104° F. or higher. The pulse is usually full and bounding, but rarely goes higher than 100 except in very severe cases, or in debilitated or alcoholic subjects. There are usually from the start great restlessness, loss of appetite, coated tongue, headache and sometimes nausea, vomiting and delirium. Headache is most common in erysipelas of the face and scalp. Delirium is particularly marked in alcoholic subjects. Simultaneous with the onset of the constitutional symptoms, and often before they are manifest, a small, shining, rose-red burning spot appears, usually on the face, oftenest on the bridge of the nose or on the chin. It is hot, tense, painful, and tender to the touch. The inflammation spreads rapidly, usually most upon one side of the head, and soon forms an elevated patch above the surrounding tissue, which is distinctly thickened and indurated. Between this and the healthy skin there is a sharp ridge forming a distinct line of demarcation from which tongue-like prolongations project into the healthy skin. As the disease spreads, the latter enlarge and finally become confluent, the line of demarcation having extended farther outward. The progress of the disease may be checked by any decided fold in the skin; particularly the naso-labial fold, or the border of the hairy scalp. In facial erysipelas the chin and anterior neck are never implicated. In some cases the disease continues to gradually extend its area, while at the same time it subsides in like proportion from the point of original infection. In this form, known as "erysipelas migrans," the disease may extend over

most of the body and extremities, the site of the primary infection being meantime entirely healed. In other cases, parts remote from the primary site of the disease may become infected either by infective embolism or by the patient's hands. In erysipelas of the face of any considerable severity there is usually distortion of the features. The eyes are closed by the tumefaction, the scalp greatly swollen, and the features unrecognizable. The swelling is always most marked in localities abounding in loose connective tissue when there is usually considerable edema. With the arrest of the progress of the disease the peripheral ridge gradually pales, and finally disappears altogether. Desquamation of the involved areas takes place, usually commencing at the point of original attack, and following up the advancing dermatitis at a proportionate speed. Vesicles and bullæ sometimes appear (vesicular erysipelas) and may proceed to suppuration forming more or less deep abscesses, sometimes involving the deeper structures of the skin (phlegmonous erysipelas). Septic inflammations of internal viscera or of any of the serous membranes may occur with abscesses resulting. The inflammation may extend to the mucous membrane of the throat and larynx, causing swelling and edema of these parts, not infrequently resulting in distressing and serious symptoms. As a result of intense local inflammation and infiltration superficial gangrene may occur. In case infection reaches the lymphatics of the post partum uterus, a most virulent and fatal form of puerperal sepsis results.

During the spread of the local inflammation, the constitutional symptoms continue in proportion to the extent and severity of the local conditions. Usually at the end of a week the disease is checked and the temperature falls rapidly to normal, and other symptoms subside. In some cases a fresh start of the inflammation takes place with a corresponding renewal of the fever and general symptoms. The latter show decided irregularities in the migrating form of the disease. The urine is scanty, high colored, and usually contains albumin. In rare cases acute nephritis results. In severe cases, especially in old people, and those debilitated by alcohol or other causes, typhoid symptoms may supervene, and death follow. Convalescence at best, even in mild cases, is comparatively slow.

Complications and Sequelæ. — Some of the complications especially liable to occur have already been mentioned. Most of the complications are due to added suppurative infection. There may be suppurative cellulitis or suppurative thrombo-pyelitis; phlegmonous abscesses; metastatic abscesses in the viscera, especially in the brain and lungs; septic inflammation of serous membranes, meningitis being the most important; otitis media, tonsillitis, ulcerative endocarditis or

pericarditis, acute articular rheumatism, pleurisy is not uncommon; pneumonia, edematous laryngitis, nephritis.

As a sequel of erysipelas, falling out of the hair is the most constant. Hyperesthesia and neuralgia of the involved areas; anesthesia with atrophy of the skin, symmetrical gangrene of the fingers, painful affections of the joints, otitis media, chronic nephritis, cicatricial formations after gangrenous destruction of parts, and abscesses in various parts of the body may occur.

Erysipelas may be associated with other infectious diseases, such as typhoid and typhus fever, diphtheria and scarlet fever.

An interesting feature in the study of erysipelas is the claim made, and quite generally admitted, that the poison of the disease exerts a favorable effect on neoplasms, causing destruction of tumor cells. Sarcoma, carcinoma and lupus, as well as eczema and rheumatism, are said to have been cured by attacks of erysipelas either occurring accidentally or induced purposely by subcutaneous injections of cultures of the streptococcus erysipelatis. It is also claimed that in a person suffering with diphtheria an attack of erysipelas exerts a markedly beneficial influence.

Diagnosis. — The diagnosis is usually easy. No doubt many cases of simple dermatitis and other affections are carelessly pronounced as "erysipelatous." The acute constitutional symptoms, the rapid spread of the disease, the location and appearance of the eruption, and the characteristic ridge-like line of demarcation are the chief diagnostic features.

Prognosis. — The prognosis is almost always favorable. The disease rarely proves fatal except from unusual complications, such as have already been mentioned, and in aged, enfeebled or intemperate subjects. Death, when occurring, is usually due to exhaustion.

Treatment. — *Prophylaxis.* — The danger of communicating erysipelas, especially in hospitals and institutions makes prophylactic measures often of great importance. The hands of the attendant should be frequently cleansed with an antiseptic solution, and the same should be practiced by the physician before visiting other patients. In no case should a physician attend a puerperal or surgical case while in attendance upon a case of erysipelas. Even with the strictest precautions there is great danger of conveying the infection in such cases. In private practice isolation is not required, but in hospitals and institutions it is of the utmost importance.

Hygienic Treatment. — Rest in bed is essential. The apartment should be well ventilated, draughts of air being avoided, and the light graded to suit the patient. The patient and bedding should be kept

scrupulously clean, and the excreta promptly removed from the room and the vessels cleansed. The strength of the patient should be sustained by highly nourishing food of a liquid character — milk, malted milk, nutritious broths, meat juices, panopepton, trophonine, etc. Water should be allowed freely. It should be borne in mind that erysipelas sometimes runs into a typhoid state simply because the system has not been sufficiently sustained by proper nourishment. With proper feeding, stimulants are rarely required, and should never be administered except when there is great feebleness, with a rapid, weak pulse, and weak heart action.

Local Treatment. — There is a wide difference of opinion as to the necessity and advisability of local measures in erysipelas. In most cases it is politic, to say the least, to employ some simple form of local treatment, but the usual heroic applications of the old school are useless and harmful. Cold water dressings, frequently changed, are valuable. When these are not agreeable and a dry dressing is needed, rye flour may be dusted over the involved parts. This at least relieves the burning and itching. Painting the parts with fincture of lobelia seems to answer a similar purpose. Cranberry juice is an old and popular local application, the fresh cranberries being mashed and applied as a poultice. Hot, moist compress of creolin, one per cent, or of carbolic acid solution, may answer a good purpose. Aside from these simple measures ichthyol is the only application I have ever used. I generally use a two-per-cent solution or cerate. Dickinson, whose loyalty to homœopathic measures was never questioned, advised penciling around the inflamed parts with *Tincture of Iodine* with the view to arrest the future spread of the disease. I prefer for the same purpose Colodion with two per cent of ichthyol added.

Therapeutics. — The chief remedies in the treatment of erysipelas are Belladonna, Rhus tox. and Apis. In ordinary cases other remedies are not required. The following may be indicated in special cases: Am. c., *Ars.*, Arn., Borax, Bry., *Canth.*, Carb. an., Euphorb., Graph., Hep. s., Kali c., Lach., Merc., Mez., Sil., Stram., Sulph., Zinc.

Belladonna (3x). — This remedy is only useful in the smooth, shining variety. It is never useful when the inflammation is vesicular or edematous. The parts are also red and hot, there is considerable fever, and often symptoms of cerebral irritation. It is the remedy usually required in the first stages of a phlegmonous erysipelas.

Rhus tox. (3x). — This remedy is only useful in the vesicular form, thus differing from Belladonna, the two drugs being typical of the two varieties. The skin is dark red, and covered with vesicles; burning and

itching; great swelling of the inflamed tissues; some edema; fever; rapid pulse; great restlessness. Rhus may follow Belladonna in phlegmonous erysipelas, in which it is the chief remedy. It is the chief remedy in typhoid forms of the disease, with mild delirium, stupefaction, restlessness; red, dry and cracked tongue; sordes; epistaxis.

Apis (3x).— This remedy is useful where edema and puffiness of the inflamed parts is the predominating feature, also when there is edema of other parts, especially of the fauces or glottis. The skin has a glistening red appearance, there is dryness of the mouth and throat, but little thirst, red and dry tongue, burning, stinging pains, scanty, painful urination, and often a mental condition of apathy and indifference bordering on unconsciousness.

Arsenicum (3x).— Grave cases. Skin looks dark, bluish or ecchymosed. Threatening gangrene. Great prostration; restlessness; quick, wiry pulse; burning pains; edema, sometimes anasarca; typhoid symptoms. Migrating erysipelas.

Cantharis (3x) is an excellent remedy in vesicular erysipelas when blisters form and where intense burning pain in the eruption is the chief indication; also when there is retention of urine or strangury. Inflammation intense and rapid tending to gangrene.

Graphites (6x).— Raue recommends Graphites when there is a tendency to repeated attacks of erysipelas bullosum; also when new aggravations come on during the same attack; constrictive headache in occiput; perspiration does not relieve. Habitual erysipelas, often alternating with tettery eruptions. Goodno considers Graphites "the most generally efficient" remedy. He always administers it "first if there are not clear indications for another medicine. The third to the sixth trituration in doses of one grain every one to three hours, is recommended. The nature of the remedy may lead some, as it did me, to avoid it in so serious a disease. The presence or absence of vesiculation, the side and part affected, and other of the ordinary indications, seem immaterial."

Hepar sulph. (3x), **Mercurius** (3x) or **Silicea** (6x) are indicated when suppuration takes place.

Lachesis (6.).— Skin has a black-bluish appearance; great prostration and depression of the vital forces; adynamic symptoms.

Sulphur (30x).— Long lasting or migrating cases; and for the purpose of arousing the reactive energies of the system, when carefully selected remedies have failed to produce a favorable effect.

Zincum (6x).— Erysipelas, especially of the head and face, with brain symptoms, and rapid, almost imperceptible pulse.

SEPTICEMIA.

Synonym. — Sepsis.

Definition. — A condition or train of symptoms induced by the absorption into the circulation of septic products.

Septicemia occurs in two distinct forms: —

1. "*Septic intoxication* is caused by the absorption of a pre-formed ferment or toxin which produces the maximum effect as soon as it reaches the circulation, and the symptoms subside with the arrest of further supply and the elimination of septic material from the circulation.

2. "*Septic infection*, on the contrary, occurs in consequence of the introduction into the circulation of living micro-organisms which multiply with great rapidity in the blood—a circumstance which imparts to this form of septicemia its progressive character." (Senn.)

Etiology and Symptoms. — Clinically we may recognize three forms of septic poisoning.

1. **Fermentation Fever or Aseptic Fever.** — This is the mildest form of sepsis, and is due to the absorption of the products of aseptic tissue — necrosis. Slight lesions, such as cuts or abrasions, where superficial necrosis occurs, the latter sometimes being induced by the use of strong antiseptics may cause mild septicemia. The injection into the blood of simple saline solutions or the transfusion of blood may give rise to aseptic fever. In animals it may follow the intravenous injection of digestive ferments. It may also result from extravasations of blood.

Symptoms. — Soon after an injury or a surgical operation the temperature rises rapidly, sometimes reaching 104° F. There are no other symptoms, and within two or three days the fever subsides. The early rise of the temperature distinguishes aseptic fever from other forms of sepsis.

2. **Sapremia** is that form of sepsis due to an introduction into the system of the products of putrefaction. It may occur without bacterial infection, but is now considered as practically the same as true septicemia. In most cases there is either local infection or infection by putrefactive organisms, comprising various forms of bacteria or of the proteus groups, due to wounds or injuries, irritants, retained clots or products of conception in the uterus after abortion or labor, or the action of bacteria. By the absorption of poisonous products a grave condition may result. The same condition also results in acute infectious diseases, such as diphtheria, scarlet fever, erysipelas, etc. Typical cases of sapremia result from tyrotoxin, and the inhalation of foul

odors by those unaccustomed to them. The former are caused by canned meats, ice-cream, sausages and cheese, and have been designated as "*Sepsis intestinalis*."

Symptoms. — There is usually at the beginning a chill or rigors, but not always. The temperature rises rapidly to 101° to 104° F., and the pulse becomes more or less rapid and weak, according to the gravity of the case. There is anemia and prostration, and quite commonly headache, delirium and restlessness. Nausea, vomiting and diarrhea are usually present in grave cases, and may usher in the attack in cases of "*sepsis intestinalis*," together with more or less severe colicky pains. The tongue may be red and have a glazed appearance, or be dry and leathery. Sepsis following childbirth belongs to this variety, and presents symptoms of about the same character as mentioned.

Diagnosis. — Usually the diagnosis is made easy by the early appearance of the symptoms and the ready discovery of the putrefactive focus, to which attention is often called by the constant fetor.

Prognosis. — This depends upon the amount of poison absorbed and the possible removal of the putrefying material. For this reason sapremia following childbirth offers the best prognosis, the symptoms rapidly disappearing after the cleansing of the uterus from putrefying debris. When the dose of the poison is large, death may result within forty-eight hours.

3. **Progressive or True Septicemia.** — This form of sepsis may be produced by any of the pathogenic bacteria invading the blood and tissues with or without a local site of infection. It most often results from the absorption of pus.

Symptoms. — The period of incubation varies from one to three days. The onset is more gradual than in the preceding forms, and there is rarely an initial chill. The temperature gradually rises to 102° to 104° F., and is often remittent or intermittent in character. In fatal cases there may be hyperpyrexia at the last. In some cases the temperature is subnormal. The pulse becomes rapid, weak and easily compressed. There is usually mental apathy and indifference, which may pass into drowsiness and stupor or delirium. Prostration is marked and appears early. There is anorexia, vomiting and diarrhea. The tongue is dry and black with red edges. In severe cases punctiform hemorrhages into the skin, or more extensive ecchymoses and rose-color eruptions appear. Edema is not uncommon, and slight jaundice may occur. The so-called "*septic nephritis*" may be present, the urine containing albumin, casts and blood corpuscles.

Diagnosis. — There is danger of confounding true septicemia with malarial or typhoid fever, but the history of the case usually reveals its

character. A careful examination of the blood for micrococci may be necessary in doubtful cases.

Prognosis. — In true septicemia the prognosis is very unfavorable. Few cases recover. Even apparently mild cases may follow a chronic course, and result fatally. Contrary to sapremia, the removal of the cause avails nothing, the condition progressing steadily to the end. Death usually occurs within a week, and in severe cases within twenty-four hours.

Treatment. — When possible, the cause should be promptly removed. This is especially practicable in cases of sapremia following abortion or confinement. The patient's strength should be supported by highly nourishing liquid foods and alcoholic stimulants. The intravenous infusion of a normal salt solution is said to be of great value. The therapeutics will be considered under Pyemia.

PYEMIA.

Definition. — A general febrile disease due to sepsis from the absorption of pyogenic organisms, and characterized by recurring chills, remissions or intermissions in the fever, and abscesses in various parts of the body caused by infected emboli.

Pathology and Etiology. — Pyemia is always caused by the absorption of pus microbes, chiefly the staphylococcus and the streptococcus. Other micro-organisms may be present, and to some extent cause or influence the development of the blood poisoning. The micrococci invade the walls of a vein lying in close proximity to the focus of suppuration and there set up a thrombo-phlebitis. The clot thus formed becomes infected by the microbes and softens into a puriform material, which, breaking up, is carried in small pieces into the general circulation. These find lodgment in vessels too small to allow their passage. This is most frequently in the pulmonary artery or its branches or may be in the liver, kidneys, spleen, cortical substance of the brain, and in other localities. The blood supply of the part is thus cut off and the conditions are favorable for the development of an abscess. The foci are small, but several may coalesce and form an abscess as large as an apple. The same condition may result from the diseased vegetations on the valves in malignant endocarditis, being broken off and carried into the circulation and so also a malignant endocarditis may be one of the results of the infected emboli. In rare cases abscess may form in the muscles, submucous and subcutaneous tissues, bones, the parotid gland, brain (cortical portion) ovaries and testicles. Should the original focus of suppuration be in proximity to the portal vein multiple abscesses of the liver result. When the primary suppurative focus is

not discoverable, the term idiopathic or spontaneous pyemia is used. The appendix and the prostate gland are often the site of the original focus in such cases. They may also occur from osteomyelitis or gonorrhea. In some very rare instances, post-mortem reveals no original focus. In such the lowering of the tone of the general system is sufficient, following a simple inflammation or contusion, which may have passed unnoticed.

Epidemics of pyemia are said to occur, especially in the late winter and early spring months.

Symptoms. — The patient may show some evidences of sepsis, or even of thrombosis of a vein near the suppurating wound, but the first warning of pyemia comes in the form of a chill, which is repeated at regular or, more often, irregular intervals during the course of the disease. The severity of the chill is proportionate to the intensity of the infection. During the chill the fever rises rapidly, and continues to rise after the chill until it reaches 103° to 105° F. It constantly presents an irregularly intermittent or profoundly remittent type, the fall in temperature being each time preceded by a profuse sweat. The rise is generally toward evening, and thus there is some resemblance to typhoid fever, while the rigors and sweats resemble those of malaria. The pulse becomes rapid and feeble. Profound prostration is present early, and emaciation progresses rapidly. Exhaustion and semiconsciousness ensue, the patient being easily aroused, but immediately lapsing into a lethargic condition.

Localized symptoms occur according to the size, number and locality of the abscesses.

Pulmonary abscesses give rise to cough and dyspnea, and also to pain if superficially located. Splenic abscesses cause enlargement with pain and tenderness. Hepatic abscesses may cause tenderness and enlargement with jaundice; in abscess of the kidney, there may be albuminuria and hematuria; in the intestines, diarrhea; in the skin, superficial abscesses; and in the joints, swelling, tenderness and fluctuation; if in the brain, there is probably more delirium, but often existing nervous symptoms are about the same. Any serous membrane may be affected secondarily. In some cases all the symptoms are more or less obscured by those of an ulcerative endocarditis.

Diagnosis. — The diagnosis is often quite difficult, especially where the primary focus of suppuration is not apparent. The diseases most liable to be confounded are malaria, typhoid fever and acute miliary tuberculosis. However, a careful study of the case will show prominent points of differentiation. Tyson says, "A cardiac murmur with irregular temperature and sweating, with unusual prostration, should excite suspicion."

Anders gives the following differential table for pyemia and septicemia :—

Pyemia.	Septicemia.
Always associated with suppuration.	Suppuration may be absent, but there may be a sloughing wound.
Multiple chills.	A single chill.
Irregularly intermittent fever curve.	Continued type of curve.
Profuse sweats accompanying febrile attacks.	Absent.
Rapid emaciation and profound prostration.	Less marked.
Nervous symptoms usually come on late.	Earlier.
Hyperesthesia.	Absent.
Slight jaundice.	Less marked (very faint).
Metastatic abscesses.	Absent.

Prognosis.—The prognosis is very grave. Some cases die within a few days. More often life is prolonged several weeks. Some cases are more protracted, assuming a chronic form. In such the symptoms are milder and less distinctive. Metastatic abscesses are not so numerous, and often the nature of the disease would not be suspected were there a history of an infected wound. Some such cases recover, but usually with the health irretrievably broken. More often death is the ultimate result, though careful constitutional treatment with homœopathic remedies unquestionably does much toward bringing about more favorable results.

Treatment.—This consists chiefly in the aseptic treatment of the primary wound, the early evacuation of abscesses where possible, and supporting the strength of the patient by a nourishing, easily digested diet and alcoholic stimulants.

THERAPEUTICS OF SEPTICEMIA AND PYEMIA.

Arnica (30x).—The power of Arnica to prevent pyemia is wonderful, and makes its application after injuries and surgical operations the more important. It causes the absorption of clots and dispels ecchymoses. It tends to prevent septic infection after hard labors, especially after instrumental deliveries, and will cause the expulsion of coagula and retained membranes. Not only are its prophylactic virtues most estimable, but also after infection takes place, it is a most useful remedy. Its chief indications are an indifferent, stupid condition, the patient falling asleep when answering a question; feels sore and bruised; the bed

seems too hard; the head is hotter than the body; suggillations; petechiæ; intestinal hemorrhage; involuntary stools; also when bedsores form.

Arsenicum (3x).—From a physiological standpoint Arsenicum covers the conditions of blood poisoning in an eminent degree, and is the remedy most often prescribed. It is particularly applicable when profound prostration and great restlessness are characteristic features. Face pale and shrunk or puffy; anxious expression; tongue glazed or brown; intense thirst for small quantities of water; loss of appetite, nausea, vomiting, involuntary diarrhea; emaciation, burning heat.

Baptisia (1x).—Great prostration and characteristic typhoid symptoms; stupor; face besotted; sordes on lips and tongue; tongue dry and brown in center, edges red; stools thin, dark and very offensive; putrid breath.

Carbolic acid (2x).—This is not only a valuable remedy locally, on account of its germicidal properties, but internally also, when putridity of the exhalations and secretions is the chief feature.

Carbo veg. (30x).—Mild forms of septic intoxication from the ingestion of ptomaines, more especially from putrid meat or fish, also in more severe forms when the vital forces are nearly exhausted; body cold, skin bluish; breath cool; thready, intermittent pulse; cold sweat on limbs.

Chininum sulph.—Quinine is the chief reliance of the old school as an internal remedy in sepsis. It may be useful where the character of the remittent or intermittent fever demands it, and when anemia and prostration are prominent features; also when there are profuse sweats, ringing in the ears, deafness and jaundice. It must be given in substantial doses. I generally give one grain every three hours.

Chininum ars. (2x).—The Arsenate of Quinine is a far more useful remedy in septic and pyemic states than the Sulphate. It combines the profound blood changes of arsenic with the anemia, debility and functional disturbances of Cinchona, and is especially adapted to low states of the system involving blood decomposition.

Crotalus (3x).—An invaluable remedy, especially when the condition is characterized by great putrescence and by a hemorrhagic tendency. Petechiæ, purpura, sepsis from dissecting wounds, vaccination or bites of insects. Gangrenous tendencies. There is great prostration; low, muttering delirium; vomiting of bile or blood; tongue dry, brown, cracked, or yellow, brown in center, red edges; urine scanty, dark, almost black, sometimes suppressed, etc.

Eucalyptus (Tincture).—Not only does this drug possess mild germicidal properties, but it is also adapted to many of the symptoms of blood poisoning, especially the remittent or intermittent type of

fever. It is probably not useful when there are profound blood changes, but only in the milder forms of septic intoxication.

Hepar sulph. (3x) is indicated for the suppurative processes, but has little effect upon the profound blood changes and their systemic effects.

Lachesis (6.). — The pathogenesis of *Lachesis* presents the most perfect picture of profound blood poisoning that our *Materia Medica* affords. It is especially useful when the blood changes are combined with the nervous and asthenic symptoms characteristic of the drug. There is always a bluish or dark-purplish appearance of affected parts; purpura; all discharges are offensive; there is stupor, low delirium, tongue dark, cracked, and bleeding easily; jaundice, aggravation of symptoms after sleep.

Muriatic acid (1x). — Late stages; profound adynamic state; involuntary discharges; sliding down in bed; sordes on teeth; aphthous state of mucous membranes; hemorrhagic tendency.

Also consult *Merc. sol.* (3x), *Phosphorus* (3x) and *Rhus tox.* (3x).

EPIDEMIC PAROTITIS.

Synonym. — Mumps.

Definition. — An acute contagious disease, characterized by an inflammation and swelling of the parotid gland, and sometimes of the submaxillary glands, the testicles, and, in the female, the mammae.

Pathology. — The morbid anatomy consists solely of bronchitis of the smaller tubes, broncho-pneumonia, inflammation of the bronchial glands, pulmonary collapse, and emphysema of the vesicular or interlobular variety. The swelling consists mainly of a serous infiltration and very rarely proceeds to suppuration.

Etiology. — Mumps may occur sporadically, but is more frequently present as an epidemic. It affects chiefly children and young adults, males more than females, and occurs mostly in the spring and fall months. It is often associated with measles and whooping cough. The disease is highly contagious throughout its course, being conveyed chiefly by the breath and exhalations. One attack usually gives immunity from a second attack, though if but one parotid gland be affected, the other may take on the disease at some future time.

Symptoms. — The period of incubation is from one to two weeks. The disease is ushered in with languor and some fever, nausea, restlessness and prostration. At the same time the patient complains of a feeling of tension or of a pain at the angle of the jaw, which is markedly aggravated upon attempting to swallow an acid, such as

vinegar. Simultaneously there may be swelling about the ear, which extends rapidly in front of the ear and below it, until the entire neck in this vicinity is involved. But one side may be affected. If both sides are involved, the left side is usually first affected, the right soon following. The maximum swelling is reached in from two to six days, the most prominent point being just below and in front of the ear. The whole swelling causes great disfigurement of the features, and gives the patient a singularly comical appearance. Speaking, mastication and especially swallowing become extremely difficult and painful, the pain often extending into the ear and producing earache, with more or less deafness, and sometimes ringing in the ears. The duration is from five to eight days, after which the swelling subsides and the symptoms disappear with the swelling. In rare cases, when but one gland is affected, the other becomes involved only as the swelling subsides in the first, thus retarding convalescence. In cases of great severity, delirium is sometimes present for a short time.

Complications and Sequelæ.—The most common complication is orchitis in the male and mastitis in the female. They occur more frequently in some epidemics than in others, and in some cases are undoubtedly due to exposure and lack of care during the attack. They very rarely occur until the swelling of the parotid gland has subsided. Usually they are easily controlled, but in some instances prove very intractable. The temperature may rise even higher than during the primary attack, and in orchitis suppuration or gangrene may occur. The inflammation lasts for three or four days, and then subsides gradually. Atrophy of the testicle sometimes follows. These complications rarely occur before puberty. Other and more rare complications are ovaritis, vulvo-vaginitis and otitis media, the latter being sometimes followed by permanent deafness. There may be also meningitis, mania or post-febrile insanity. Facial paralysis, convulsions, albuminuria and arthritis have been observed.

Diagnosis.—The diagnosis can hardly be mistaken. Secondary parotitis from septic infection occurring during the course of typhoid fever and other infectious diseases must not be confounded with mumps. It is a much more serious affection, and usually terminates in suppuration.

Prognosis.—The prognosis is invariably favorable in uncomplicated cases. Complications lengthen the course of the attack, but complete recovery is the rule.

Treatment.—The patient should be isolated from other children and kept in bed. The diet must be liquid, but should be of a nourishing quality. Either hot or cold applications may be used which-

ever is most grateful to the patient. I generally use neither one, but keep the inflamed parts covered with absorbent cotton, in some cases smearing them with vaseline or some simple ointment. Vaseline one ounce, and biniodide of mercury one-half drachm, have seemed to do excellent service. Others recommend ichthyol ointment, but I have never used it. Hale recommends Belladonna or Phytolacca ointment, giving the same remedies internally. Hot fomentations containing hamamelis, veratrum viride, or hot hop poultices may be beneficial. If the testicles become involved, they should be supported by a suspensory bandage, and likewise if the mammæ become involved they should be held up by sustaining bandages.

Therapeutics. — The chief remedies are *Belladonna*, *Mercurius*, *Rhus tox.* and *Pulsatilla*. As a rule, the two former, and frequently *Mercurius* alone, are all that is needed.

Belladonna (3x). — This is usually the first remedy required. Bright-red, shining swelling, especially of the right parotid, throbbing headache, red face, and injected eyes, the pains occurring paroxysmally and being of a darting, lancinating character.

Merc. sol. (3x) follows *Belladonna* well. Often indicated from the first when the parts are much swollen but pale, and the left side affected; little fever; alternate heat and chills; nightly thirst; tendency to night sweats; salivation; offensive breath; flabby, tooth-indented tongue. The biniodide of Mercury often answers an excellent purpose.

Rhus tox. (3x). — This remedy may be required if the swelling is dark red and edematous, and when typhoid symptoms supervene.

Pulsatilla (3x) is the first remedy to be thought of when orchitis or mastitis becomes manifest, and *Clematis* should also be considered.

For further treatment of orchitis and mastitis, see respective articles on those subjects. For persistent induration: *Aurum met.* (6x), *Baryta iod.* (3x), *Calc. iod.* (3x), *Conium* (3x).

For suppuration: *Hepar sulph.* (2x), *Mercurius* (3x), *Silicea* (6x).

For delayed resolution: *Sulph.* (30x).

For malignant cases: *Arsen.* (3x), *Lach.* (6.), *Kreos.* (3x).

WHOOPIING COUGH.

Synonyms. — Pertussis, Tussis Convulsiva.

Definition. — Whooping cough is a contagious disease with inflammation of the respiratory tract, and characterized by a paroxysmal spasmodic cough, accompanied by a long-drawn inspiration producing the "whoop," whence the disease is named.

Pathology. — The lesion consists at first in a naso-pharyngeal catarrh which later on extends to and involves the larynx, trachea and

bronchi. Post-mortem shows no changes save those that result from complicating lesions—bronchitis of the smaller tubes, broncho-pneumonia, inflammation of the bronchial glands, pulmonary collapse, and emphysema of the vesicular or interlobular variety.

Etiology.—The disease is one of childhood but is by no means uncommon in adults, being sometimes a serious disease when attacking people after middle age. It may occur sporadically, but usually appears in epidemics. These are most frequent in the winter and early spring months, and are often associated with epidemics of measles. The disease is directly contagious, but not to the same extent as measles and scarlet fever, as it is seldom propagated to any great degree in schools, but seems to require personal contact and prolonged exposure. There are, however, some exceptions to this rule. One attack as a rule procures immunity, but this is not invariable. It is not unusual for an adult to have whooping cough who had already had the disease during childhood. Barring a possible mistake in diagnosis, I have known many instances of whooping cough occurring more than once in the same child.

The organism of whooping cough, if there be one, has not been isolated with absolute certainty. It is probably, however, a germ disease, but it is not clear as to how the symptoms are produced, though no doubt there is a direct nerve irritation. The disease is supposed by many to be a pure neurosis, involving either the pneumogastric, phrenic, sympathetic, or recurrent laryngeal nerves. After an exhaustive study of the subject, Anders concludes that we undoubtedly “have in whooping cough an infectious catarrhal process which affects the mucous membrane controlled by the superior laryngeal nerve, and the value in many cases of purely local treatment indicates that the abode of the germs is in this region, whence the poisonous products of their growth are absorbed.”

Symptoms.—The duration of the incubation period is uncertain owing to the insidious onset of the disease, but it is probably from seven to fourteen days. The first symptom is a cough which is not peculiar and is usually worse at night. It gradually grows more severe, being somewhat hoarse and metallic in character, and has associated some fever and coryza, giving the appearance of an ordinary severe cold. A characteristic at this stage is the swelling and pink color of the under lids. These symptoms usually continue about two weeks. At this time the cough assumes a paroxysmal type, and suddenly the characteristic “whoop” is observed. The paroxysms become more frequent and more severe. They consist of a series of coughs so rapid and spasmodic that the child can not get its breath, and suffocation seems imminent. The face becomes suffused; the eyes injected and bulging, the tongue is

cyanotic and protrudes. Finally there occurs a long, deep inspiration with the characteristic whoop, which may terminate the paroxysm, or the paroxysm may be immediately repeated, this in some cases occurring three or four times until the child is exhausted. Very frequently severe paroxysms terminate in an act of vomiting which brings up considerable mucus, and in most cases a little blood. In some cases the whoop is the first indication of a coughing attack. In rare cases there is only the paroxysmal cough without any whoop. The termination of the paroxysms is followed by temporary relief. The paroxysms are usually induced by a quick inspiration, as during drinking, eating or crying. The number of paroxysms during twenty-four hours may range anywhere from three or four to fifty or sixty. They are usually more frequent at night than during the daytime. If the case is severe, the paroxysmal stage develops a peculiar appearance due to the violence and congestive character of the cough. The face becomes swollen and puffy, the features dusky, the eyes injected and the lids swollen and pink in color. There is more or less prostration, and sometimes, a mild continuous fever. The child is nervous and fretful, and nutrition suffers. Physical examination reveals nothing save a few moist râles, unless a broncho-pneumonia is present. The paroxysmal stage varies in duration from two to six weeks. I have seen many mild cases where but a single severe paroxysm with its characteristic whoop occurred. Finally the paroxysms grow less severe and less frequent, the whoop ceases, and there remains only a terminal bronchitis which slowly declines. The whole duration of the disease until convalescence is fully established varies from six to twelve weeks.

Complications and Sequelæ. — The chief complications of whooping cough are bronchitis, broncho-pneumonia, and collapse of the lungs, pleurisy, and interstitial emphysema. Other possible complications are epistaxis, hemoptysis, pericarditis, laryngitis, hernia, and convulsions. In very young children there may be profound stupor instead of convulsions, a condition of still graver significance. Cerebral paralysis and death from subdural hemorrhage are said to have occurred in whooping cough.

The most-to-be-feared sequel is acute tuberculosis or tubercular broncho-pneumonia. Quiescent tubercles are often made active by whooping cough. Atelectasis producing a permanent flattening of the chest and the so-called pigeon-breast may result from whooping cough. Acute nephritis as a possible sequel of whooping cough must not be overlooked. Marasmus is sometimes a formidable sequel. Those who have had whooping cough may have an occasional return of paroxysmal cough with whooping on taking cold at intervals of months and even years afterward.

Diagnosis. — The only two features upon which a positive diagnosis can be made are the characteristic whoop and the pink under eyelid. Of course the appearance of the whoop settles the diagnosis, but in some cases, as in very young infants, or in cases complicated with pleurisy, there is no whoop, and then the pink under eyelid may prove a valuable diagnostic sign. There is a peculiar puffiness of the face, especially about the eyes, and a dusky color in whooping cough that is seen nowhere else. Anders contends that "we may diagnose whooping cough in its earliest stage by the characteristic swollen condition of the eyes and face."

Prognosis. — In uncomplicated cases the prognosis is favorable, but associated with complications, whooping cough is a very grave and fatal disease. The pulmonary complications that have been mentioned are much more severe and dangerous than when occurring primarily. The most frequent combination proving fatal is broncho-pneumonia. The younger the child, the greater the danger.

Treatment. — The peculiarities of whooping cough are such that isolation is not practicable in most cases. Nevertheless it should be carried out as far as possible. Especially should very young children be protected from exposure to the disease, if such a thing is in any way possible. There is most danger of infection during the paroxysmal stage, and the danger declines with the terminal bronchitis, but does not persist after the second month. The usual methods of disinfection of rooms, clothing, etc., as required in other infectious diseases, is unnecessary in whooping cough. The disease is only feebly, if at all, conveyed by fomites. Of late, however, the opinion is gaining ground that the sputum contains the medium of direct communication of the disease, and consequently care should be taken to have the sputum collected in spit cloths and burned, or a cuspidor or basin containing water may be used and the contents buried. There is no known prophylactic medicine. The child should be kept in warm, sunny, well-ventilated apartments. Mild cases, without pulmonary complications, should be encouraged to spend as much time as possible in the open air, though avoiding inclement weather, and should be warmly clothed with flannel next the skin. Nourishment should be kept up by wholesome foods. Concentrated liquid foods, milk and eggs, constitute the best dietary.

Local Treatment. — Those who believe that whooping cough is purely of microbic origin, have great faith in local treatment with germicides. Anders mentions two cases cut short by the use of a gargle of hydrogen peroxide. This is certainly a harmless remedy. It probably might be used better in the form of a spray. Various inhalants

have been recommended and used, such as thymol, carbolic acid, cocaine, bromine vapor, tar, benzoin, terebene, sulphuretted hydrogen, and illuminating gas (carburetted hydrogen). Cresoline lamps are used quite extensively. I must confess that I have never seen the slightest benefit result from the use of any of these agents. On the contrary, they vitiate the atmosphere, and do the patient injury. Possibly beechwood tar, used with a hot-air apparatus, might prove of material benefit. Dr. Mohn claims to produce immediate and permanent cure of whooping cough by fumigations with sulphur. He proceeds as follows: "In the morning the children are clothed and removed from their sleeping rooms, in which are hung all the clothing, toys, and everything the children use. In this room about four ounces of sulphur for every cubic yard of space is ignited, and the sulphurous acid allowed to remain in the room about five hours. The room is then well aired, and the next evening the child sleeps in the room and bed, which is completely disinfected. The fumes should be strong enough to irritate but little the throat and nasal passages." Antitussin is the latest remedy brought out for local use in whooping cough. In some cases it has given great relief, and apparently cut short the course of the disease.

Therapeutics.—It is generally admitted by old-school authorities that they have no successful treatment for whooping cough. Tyson says: "The treatment of whooping cough is one of the opprobria of medicine. Notwithstanding the claims of many to the contrary, it remains a fact that we possess no means of cutting it short." On the contrary, Anders says: "To abort cases within two weeks is not unusual." This, however, refers to the early local treatment with germicides. The use of opiates, bromides and the coal-tar products is to be condemned. There is no question as to the superiority of homœopathic therapeutics in whooping cough. That the disease is very often, if ever, aborted is not probable, but that careful homœopathic prescribing will in most cases mitigate the severity of the disease, shorten its course, and control largely the advent and course of complications is a moral certainty. The chief remedies, in the order of their usefulness, according to my own experience, are: *Bell.*, *Tart. emet.*, *Ipec.*, *Dros.*, *Hyos.* and *Cuprum*. Other frequently used remedies are: *Corallium rub.*, *Gels.*, *Hepar sulph.*, *Iodine*, *Kali brom.*, *Nephitis*, *Moschus*, *Nux vom.*, *Phos.*, *Sambucus*, *Sang.*, *Spong.*, *Sulph.* Any of the cough remedies may at times be indicated and useful, and complications may give rise to symptoms demanding any other of the long list of remedies found in our *Materia Medica*. I shall only give the indications for a few of those most frequently found useful.

Belladonna (3x). — I consider this our most important remedy. Not only is it indicated in the dry cough often present in the first stage, but it is particularly adapted to the paroxysmal stage. The suddenness of the attack, the spasmodic character, the aggravation at night, the congestion of the head and face, causing coryza and epistaxis, the constriction of the throat and tightness of the chest, — all go to make a perfect picture of this drug. Clinical experience shows it to be one of our most successful remedies in the treatment of the disease.

Tartar Emetic (3x). — I consider this drug next to Belladonna in frequency of usefulness, though I am aware that others place Ipecac ahead of it. It is especially useful in severe cases and with pulmonary complications when there is much rattling of mucus in the chest, rapid pulse, nausea, vomiting and drowsiness. Sometimes this accumulation of mucus in the chest threatens suffocation, and cyanotic symptoms become manifest. In all cases the patient is at once relieved if he succeeds in expectorating, or if vomiting occur.

Ipecac (2x). — This drug is certainly one of our most important and useful remedies. There is much rattling of mucus when breathing and coughing, but not to the same extent as in Tartar emetic, but there is less drowsiness, prostration and tendency to collapse; the cough is spasmodic, recurring in paroxysms, and followed by vomiting; and there is hemorrhage from nose and mouth, loss of breath, face pale or blue, and the body becomes rigid.

Drosera. — This remedy is extensively employed. I have never derived benefit from it except after administering it in drop doses of the mother tincture. The paroxysms are so violent and follow each other so rapidly that the child can not get his breath; usually worse at night, immediately after lying down or after midnight, often from tickling in the larynx, frequently ending in gagging, vomiting and cold sweat. There seems to be a contraction of the throat and chest, also sometimes of the abdomen and sides; has to hold his sides with his hands. Sometimes hemorrhages occur from the mouth and nose during or immediately after the paroxysm.

Hyoscyamus (3x). — By many physicians this remedy is considered of first importance, and no doubt it is of great value. The alternation of Hyoscyamus and Ipecac is a very common and popular prescription. At night the cough is dry and spasmodic, aggravated by lying down, and better when sitting up; face dark red, bloated and distorted; constriction of the throat; much mucus in the larynx and air passages. The use of Hyoscyamus is seldom based on its symptomatic indication, but rather on general principles as a nerve sedative.

Cuprum met. (3x). — Not only useful when complicated with convulsions, but also in the spasmodic stage when the paroxysms are violent and long lasting; very difficult respiration from contractive spasms of the chest, almost suffocates, face becomes purple; violent vomiting.

Corallium rubrum (3x). — This has proved a valuable remedy in whooping cough when the paroxysms occur in rapid succession, and are extremely violent; causing the child to become purple in the face, followed by exhaustion and vomiting of mucus. The paroxysms are excited by deep inspiration, and are more frequent toward evening.

Gelsemium (2x). — This remedy is gaining some reputation in the treatment of whooping cough. It has few symptoms of the respiratory system, but is frequently quite homœopathic to the catarrhal stage. E. M. Hale gives the following indications: Paroxysms of hoarseness and coughing from tickling and dry roughness of the fauces; severe, convulsive, spasmodic cough; soreness of the chest when coughing; heavy and labored respirations; expirations sudden and forcible.

Naphthalin (2x). — With many this is a routine remedy, and is highly praised. Goodno uses it with great satisfaction in the first decimal trituration, giving it in all cases, "as soon as the nature of the case has been apparent." The paroxysms are long lasting, coming on suddenly, and the constriction of the throat is marked. There are few catarrhal symptoms. The indications in general are quite similar to those of Corallium.

ACUTE MILIARY TUBERCULOSIS.

Synonyms. — Diffuse General Tuberculosis, Acute Tuberculosis.

Definition. — An acute tubercular infection characterized by the rapid development of miliary tubercles in many and various parts of the body, due to a general infection through the blood and lymph vessels, usually resulting from autoinfection caused by the breaking down of a tubercular nodule in some part of the body.

Pathology. — The general pathology of tuberculosis has already been considered under Diseases of the Lungs. Aside from the almost invariable presence of an old tuberculous focus somewhere in the body, the morbid anatomy of acute miliary tuberculosis consists in the presence of tubercles in various parts of the body. They are usually about the size of a millet seed, but two or more may coalesce, and form what appears to be a single tubercle of larger size. There is no regularity in their distribution. They are found most frequently in the lungs, liver and spleen; less frequently, the marrow of the bones, the

heart, the choroid and the meninges. Still less frequently are they found in other parts. Sometimes they may be plainly seen by the naked eye, especially in the lungs and meninges, but more frequently a microscope is required. According to their location in various organs do they give rise to variations in clinical types.

Etiology. — The general etiology of tuberculosis has already been considered under Diseases of the Lungs. Acute miliary tuberculosis results from a general infection consequent upon the bacilli from a local tubercular lesion finding their way into the general circulation; lodging in various organs they develop tubercles. The primary local lesion may be in any of the lymph glands or in the lungs. In a vast majority of cases it is in the thorax, most frequently a tubercular bronchial gland softens and ruptures into a pulmonary vein. In rare cases rupture may take place into the thoracic duct, the bacilli passing into the subclavian vein. Cases of miliary tuberculosis have followed as a direct result of the use of Koch's tuberculin, given for the cure of a local tubercular disease. The disease is mostly confined to children and adolescents, but adults are not exempt. It sometimes follows acute infectious diseases, especially measles, whooping cough and influenza. It may follow lobar pneumonia with tardy resolution, especially in adults.

Symptoms. — As a rule, general symptoms common to all forms of acute miliary tuberculosis are present. These are due to the general infection. In addition to these there are present in each form symptoms dependent upon the locality and extent of the disease in the various viscera. Fever is the most marked of the general symptoms. It may be continuous, but more often is intermittent or remittent in character, resembling malarial fever. Usually the exacerbation is in the afternoon and evening, but in some cases the highest temperature is during the morning hours,—a condition rarely found in other diseases. The pulse is always weak, and much more rapid than the temperature would indicate. The breathing is usually rapid, and the patient complains of shortness of breath. There are frequently profuse sweats, either following remissions of the fever, or occurring at irregular intervals regardless of the temperature. The mind is usually clear, except in meningeal and typhoid cases. The spleen is usually enlarged. The urine high-colored and scanty, and may contain albumin. Toward the end typhoid symptoms usually supervene.

1. *Typhoid Form.* — This is the form usually present in general miliary tuberculosis. The above-named symptoms are present, but early assume a more distinct typhoid character. The temperature reaches as high as 103° to even 105° or 106° F., and pursues very nearly a typical typhoid course. There is a dusky pallor of the face, the cheeks

often showing a circumscribed redness during the height of the fever. The tongue becomes dry and often brown, and sordes is not unusual. There may be epistaxis. There is profound prostration, and in protracted cases anemia and great emaciation. A slight bronchial cough is usually present. These cases may pass into the pulmonary or meningeal form, rapidly developing the symptoms due to the localized disease, and proving speedily fatal. Tubercles in the choroid may usually be detected by expert ophthalmologists.

2. *Pulmonary Form.* — This form may follow the typhoid form, or may develop as distinctly pulmonary from the onset. The latter is the case when the disease follows measles or whooping cough, supervening upon a previous catarrhal bronchitis. The symptoms may develop suddenly following a severe chill, or, more often, gradually following an unaccountable decline in the general health. There is at first a moderate cough which becomes rapidly more severe, and may be attended with a slight expectoration of muco-pus, sometimes admixed blood and containing bacilli. There is rapid breathing, frequently dyspnea, the latter often becoming pronounced and causing a characteristic cyanotic color. The physical signs are those of a broncho-pneumonia, with patches of dry pleurisy. This form usually runs a rapid course in children. In older persons it may be more prolonged. Toward the close the dyspnea and cyanosis increase, and the patient seems to die from suffocation.

3. *Meningeal or Cerebral Form.* — *Tuberculous Meningitis.* — This is a very frequent form. It presents the symptoms of general miliary tuberculosis plus those of meningitis. In many cases the meningeal symptoms entirely overshadow the general symptoms. If this form occur in adults, there may be no involvement of other viscera. It is rarely seen except in children between two and seven years of age, and very rarely occurs primarily. Usually for one or two weeks previous to the development of the disease, in those cases not preceded by the general or typhoid form, the child is peevish and fretful, has headache, photophobia, loss of appetite, coated tongue, vomiting and constipation. Gradually the vomiting becomes more severe, the headache more marked, and fever makes its appearance. The temperature rarely rises above 102° to 103° F., and the pulse 120 to 130. The child becomes very irritable, and shows an unnatural obstinacy. Gradually these symptoms become more distinctly cerebral, the child becoming drowsy or delirious, passing into coma or acute mania, and finally convulsions. In rare cases the onset is sudden, the cerebral symptoms being at once manifest, convulsions being usually the initial symptom. During the stage of cerebral excitement the symptoms are those of an acute meningitis. The pain is excruciating, and is greatly aggravated

by the slightest motion and from noise and light. The pupils are contracted, sometimes unequally, sometimes alternating with dilatation. Ptosis is frequently present. The patient lies as quiet as possible, and is intolerant of being disturbed. Delirium more or less violent, even to acute mania, may be present. There are muscular twitchings and starting in the sleep. Gradually the pulse and respiration become more or less irregular, there are slight convulsions and some paralyses. The symptoms of cerebral excitement now give way to those of cerebral pressure. The mental faculties now become abolished and coma and convulsions are present. Localized convulsions and paralyses occur according to the seat of the involvement. Aphasia, hemiplegia and various monoplegias are common. If the base of the brain is involved, there is retraction of the head, paralyses of the cranial nerves from pressure, and optic neuritis. If also the spinal membranes are involved, the symptoms are those of cerebrospinal meningitis. The temperature gradually falls to subnormal, but usually immediately preceding death rises to 106° to 107° F. Cheyne-Stokes breathing is present and the patient usually dies from asthenia, typhoid symptoms being very commonly present.

Diagnosis.—The diagnosis is aided by the known presence of a previous tubercular lesion. If bacilli are found in the blood and tubercles on the choroid, the question is settled at once, but the latter can only be determined by an experienced ophthalmologist. In most cases the patient makes no complaint, and insists that he is all right and will soon be well, though the serious character of the disease is quite apparent. In the general or typhoid form there is great danger of mistaking the disease for typhoid fever, but the temperature course is decidedly more irregular; and the pulse is more rapid in proportion to the temperature. The respiration is more hurried and labored, there are no characteristic abdominal symptoms, no rose-colored eruptions, no typhoid bacilli in the blood, and very rarely intestinal hemorrhage.

In the pulmonary form the previous family history of tuberculosis, the predisposition and the presence of a previous tubercular lesion are strong diagnostic points. Usually the advancing lung lesion with diffused râles is easily detected, and later consolidation and breaking down in small areas. If tuberculous meningitis or peritonitis supervene, the case becomes clearer. As a last resort, search should be made for the bacilli in the blood.

In the meningeal form we have the symptoms of meningitis superadded to those of general miliary tuberculosis.

Prognosis.—Acute miliary tuberculosis invariably terminates fatally sooner or later. Deceptive improvement sometimes takes place,

but lasts only a short time. Some cases die in a week or ten days, but more often the course of the disease is from four to eight weeks, and often longer.

Treatment.—The usual prophylactic measures and hygienic treatment for tuberculosis should be followed in the pulmonary form as far as practicable. Likewise in the typhoid and meningeal forms, the usual hygienic measures adopted in typhoid fever and acute meningitis respectively must be followed, modified by the individual characteristics of the case in hand. This is particularly true as regards the diet in typhoid cases. The medicinal treatment is purely symptomatic. While the disease is incurable, yet much may be done to benefit the patient, and often retard the rapid progress of the disease. The remedies mostly required and their indications are practically the same as have already been considered under the head of Tuberculosis.

SYPHILIS.

Synonym.—The Pox.

Definition.—A specific, constitutional disease, acquired or inherited, due either to inoculation or direct contact with a specific virus, or to hereditary transmission, and characterized by a variety of structural lesions of which the chancre, the mucous patch and the gumma are the most distinctive.

General Pathology.—“(a) **Primary Lesion or Chancre.**—This appears at the site of inoculation, and is characterized by infiltration of the connective tissue, chiefly with round cells, and also by larger epithelioid and giant cells. This is followed by a shallow ulcer of the size of a split pea or larger, of which the base is quite hard, the sclerosis being due partly to cellular infiltration and partly to a marked thickening of the intima of the small arteries (acute obliterative arteritis). Adjacent lymphadenitis, more or less marked, is constantly present, and, rarely, all the peripheral lymph glands in the body are swollen.

“(b) **Secondary Lesions.**—*Condylomata* are the most common. Their favorite sites are the points at which the mucous membrane and the skin are continuous (mouth, anus, etc.); their contour is more or less rounded or oval; their surface readily abraded and usually ulcerated; and their size varies from a pin's head to an inch or more in diameter. Like the Hunterian chancre, their periphery is more or less indurated. Secondary lesions also include skin eruptions and ocular inflammations, etc., but these can only be referred to under later symptomatology.

“(c) **Tertiary Lesions.**—These are circumscribed inflammatory products (gummata) appearing in the connective tissue, bones, peri-

teum ("nodes"), skin, muscles, brain, liver, lungs, kidneys, heart, testes, etc. The gummata, though usually sharply circumscribed, may take the form of diffuse infiltrations of the affected parts, and vary greatly in size from a pin's point to a hen's egg. Usually firm, they may be soft, and, particularly on mucous membranes, tend to disintegrate, forming ulcers. Their color is grayish, and on section they show a caseous semiopaque center, with a fibrous and more or less translucent periphery. They may occur singly or in groups." (Anders.)

Etiology.—A bacillus has been found in the lesions by Lustgarten and others, but whether it is the real cause or not has not been definitely determined. Since the disease is generally acquired in sexual congress, hence its earliest manifestations appear upon the genital organs, but any abraded surface of the body, if brought in contact with the syphilitic poison, may give entrance to the infection. The secretions of all primary and secondary lesions of the skin and mucous membranes are potent to produce the disease. The products of the third or gummatous stage are not so regarded.

Modes of Infection. — 1. *Sexual Intercourse.*—This is the source of infection in a large majority of all cases. 2. *Accidental Inoculation.* This may occur through the medium of infected surgical, gynecological or dental instruments, and by razors, pipes, cigars, drinking and eating utensils, etc. The hands may become infected in the course of surgical and obstetrical work upon syphilitic patients. The lip-chancres communicate the disease through kissing and beastly practices. The wet nurse may infect the mouths of suckling babes, or, on the other hand, the infant may infect the nipple of the nurse. Infection may be caused by the use of humanized virus in vaccination, but this is of rare occurrence. The disease is not transmitted through normal secretions. A person having once acquired syphilis can rarely be re-inoculated.

3. *Hereditary Transmission.*—This is most common through the father (sperm inheritance) and less often through the mother (germ inheritance). The father may transmit the disease when he has first become infected and during the activity of the disease, which is the time of greatest danger, or after the active manifestations of the disease have disappeared. Fortunately in the latter case, if proper treatment has been had, the offspring escapes. The firstborn of a syphilitic father is more apt to show well-marked signs of the disease than are the children who are born later, each succeeding child showing still less evidences of the disease. It must be remembered, however, that it is possible for a syphilitic father to beget healthy children. In most cases both parents are infected, the one from the other, which renders the danger greater to the offspring. As a general rule, it may be said that with judicious

treatment the transmissive power rarely exceeds three or four years. (Osler.) A syphilitic mother may bear syphilitic children from germ infection; but the child may be infected at the moment of its birth when the syphilis is congenital but not inherited. A woman may bear a syphilitic child, and, though herself without signs of the disease, will not, according to Colles's law, be infected by her child should she suckle it while it has syphilitic ulcers of the lips and tongue. Yet a healthy nurse who suckles this same child or merely handles it and dresses it, may be infected. This is a sort of protective vaccination, or possibly an example of protection through a natural antitoxin absorbed from the syphilitic fetus by its non-syphilitic mother. The mother may be infected after conception, in which case the child may be, but is not necessarily, born syphilitic.

Symptoms of Acquired Syphilis.—The course of syphilis is divided into three stages: 1. *Primary Stage.*—This stage covers the period between the moment of infection and the appearance of constitutional symptoms, and usually lasts from eight to ten weeks. This period may be divided into two substages. The first covers the period of incubation from infection until the appearance of the initial lesion, which is from fourteen to twenty-one days. The second substage lasts from the appearance of the initial lesion until the outbreak of the constitutional symptoms, being from five to eight weeks. There are no symptoms during the first substage. The second substage is marked by the appearance of the initial lesion or chancre, soon followed by swelling and induration of neighboring lymphatic glands. The primary sore usually appears in the male on some part of the penis, especially in the prepuce, and in females the labia and vaginal part of the cervix. It may be so small as to escape notice, especially when within the urethra. It begins as a red papule, which subsequently softens in the center, and forms an ulcer with a hard, gristly base and edge, constituting the hard or indurated chancre. As a rule there is but one chancre. The peculiar induration is easily recognized by pinching the sore between the fingers. When situated upon a mucous membrane, the induration is not characteristic, the sore being always in the form of a chancrous erosion, which may be so slight as to escape observation, especially in the female. Suppuration may occur from secondary pus infection. Swelling and induration of adjacent lymph glands is almost invariably associated with chancre. These are known as buboes. They may suppurate or remain persistently indurated, the latter being termed indolent bubo. There may be but one gland affected, or they may be multiple, involving the glands in both sides. Often the lymphatics entering the glands may be felt as indurated cords.

2. *Secondary Stage*.—This stage, which comprises the fever, exanthemata and their complications, lasts from one to three years. Secondary symptoms usually develop within six or eight weeks, though in rare cases they may not show for three months. Sore throat is one of the first of these symptoms, and is usually associated with moderate fever, the temperature rarely exceeding from 101° to 103° F. It is usually remittent in character, and lasts but a few days, though in exceptional cases it has been known to persist for several weeks, giving rise to a diagnosis of malarial fever. There is usually languor, headache, bone pains, indigestion and some prostration. The patient presents an anemic appearance, the so-called syphilitic cachexia. With the sore throat there is hyperemia of the fauces, often with intractable, gray-based ulcers, and less frequently with mucous patches and syphilitic warts. The tonsils may also be swollen and ulcerated, and the inflammation may extend into the Eustachian tube and middle ear, producing impaired hearing. There is often a sharp line of demarcation shown on the soft palate. The ulceration is shallow, and presents a sharply defined border. Often the larynx becomes the seat of ulceration, which may heal and leave permanent cicatricial deformity.

The so-called syphilides consist of eruptions of various characters. A roseolar, or dull, copper-colored eruption usually appears in about the eighth or tenth week. It is symmetrical, follows the cleft lines of the skin and appears first upon the abdomen, then upon the chest, the shoulders, the arms and the forearms. The face is usually exempt. These persist from one to three weeks. About the third month a papular eruption appears. The papules are small, hard, do not ulcerate, and appear in groups on the face, dorsum of the tongue and on the trunk. They frequently form a row below the line of the hair on the forehead, constituting the *corona*.

Venerea.—A pustular eruption somewhat resembling that of small-pox may occur, but is rarely seen before the fourth month. These may be large like impetigo, or they may be changed into deep ulcerations covered by rupial crusts. A squamous eruption is also described. It is less scaly than psoriasis, and is especially distinguished by its coppery hue. It involves preferably the backs of the arms and the front of the thighs. When papules occur in regions where there is moisture, as about the arms and vulva, they lose their papular appearance, become sodden, and devoid of epidermis, and show white points on their surface. These are then termed flat condylomata. Papules, appearing at the angles of the mouth, tongue, gums, pharynx, vulva, vagina, penis and around the anus, may macerate and be transformed into ulcers

or mucous patches and condylomata. These are often intractable, especially when occurring in the mouth.

Other secondary symptoms are iritis, more rarely choroiditis and retinitis, laryngitis, epididymitis, brittleness and distortion of the nails (syphilitic onychia) and alopecia. The latter is especially liable to affect the eyebrows.

All secondary symptoms may be severe, mild, or entirely absent, owing to the severity of the attack, entirely dependent upon the dose of the virus received and the condition of health favoring receptivity at the time of infection. Often a weak spot in the system receives the brunt of the disease, while other parts seem free from the ravages of the disease. This explains why in different patients we obtain different visceral lesions.

3. *Tertiary Stage.* — The secondary stage lasts a year or more, after which the patient may be apparently in good health for a greatly varying interval, from months to years, before the tertiary stage sets in. However, the tertiary stage may set in without such interval of good health, and it is not very unusual to have tertiary symptoms begin to develop during the secondary stage.

The tertiary stage is characterized by late syphilides, gummata, amyloid degeneration, sclerosis and visceral disease. The syphilides occurring in the tertiary stage consist of rupia, pustules, psoriasis and periosteal nodes. The rupia are most common. They consist of pustules which break, forming ulcers covered with dry crusts and lanced scales. The ulcers are deep, constituting loathsome sores, and on healing leave ugly cicatrices. Tubercular pustules and unsymmetrical serpiginous eruptions also characterize the tertiary period. These occur especially in the neighborhood of the sacrum; on healing, they become scars. They are neither infectious nor contagious. Periosteal nodes along the course of the tibiæ are commonly observed. They also occur in the nose, palate and skull, often resulting in bone necrosis. Syphilitic periostitis is characterized by nocturnal pains, said to be due to pressure from distended veins. Gummata may develop in the skin, the subcutaneous tissues, the mucous membranes, the muscles, the joints and the viscera. In the skin, mucous membranes and subcutaneous tissues, they may break down and ulcerate, with extensive sloughing and cicatrization. When located in the larynx or trachea or in the rectum, they may be followed by stenosis. In the nose, they may destroy the cartilages, and in the throat, the palate and tonsils likewise. In the muscles, gummata form small, hard tumors. Late in the disease, often ten or more years after the primary stage, they may involve the glandular organs. In pregnant women they may involve the placenta,

inducing miscarriage, though the latter may be due to the direct action of the syphilitic virus upon the ovum. In some instances, gummata become absorbed, in others they undergo cheesy degeneration or fibroid change, become ossified, or, more rarely, suppurate. Gummata of the internal organs frequently undergo fibroid transformation with puckering and deformity. These will be referred to again under visceral changes. Amyloid degeneration is a very common tertiary affection. Sclerotic changes, such as arterio-sclerosis, arteritis obliterans and locomotor ataxia also occur.

In very rare instances syphilis occurs in a malignant form, running through all stages in a rapid course and invariably resulting fatally.

Symptoms of Hereditary Syphilis.— In congenital syphilis the primary stage is absent, but all the symptoms described in the secondary and tertiary stages of acquired syphilis may be present. Visceral changes are more prominent, especially those of the abdominal organs. In some cases the symptoms are present from birth, but in a vast majority of instances they develop between the first and fourth months of life, more often between the fourth and eighth week.

When the disease is present at birth, the child shows evidences of malnutrition, and is poorly developed. It may be emaciated, have the snuffles, and the lips and other muco-cutaneous outlets may be fissured. Pemphigus neonatorum appear as bullæ on the hands and feet, and less often there is psoriasis of the palms of the hands and a transitory roseola. The liver and spleen are enlarged, and the epiphyses may be separated. Gummata may be found about the radio-carpal articulations, and hyperostoses of the long bones may be present. Such children rarely survive. In most cases coryza and cutaneous eruptions, especially about the nates, appear from the fourth to the eighth week, the child having been born in apparent perfect health. The coryza is due to syphilitic rhinitis. The discharge is sero-purulent or bloody, and gives rise to "snuffles," which render nursing difficult. Ulcers may form in the nose, and destruction of the nasal bones occur, often causing a characteristic sunken or deformed nose. The middle ear may also become involved with otorrhea and deafness.

The cutaneous eruptions appear, usually as brownish-red patches, with a well-defined border, or they may be papular, or, indolent boils, with a copper-colored base, may develop. Pemphigus may attack the palms and soles. Fissures (rhagades) are apt to develop about the lips and angles of the mouth, the secretions from which are intensely virulent. In healing these leave characteristic cicatrices. There may be onychia, alopecia, ulcerations of the skin and mucous membranes and moderate glandular enlargement, the latter not being so common

as in acquired syphilis. Lesions of the bones may develop, thinning of the bones of the skull or irregular growth of bones being most common. Disease of the epiphyseal cartilages of long bones with separation and sometimes suppuration and disease of the cartilages of the ribs are very common. The notched or "Hutchinson teeth" are characteristic and distinctive of hereditary syphilis. The teeth usually affected are the permanent central incisors of the upper jaw. The teeth are peg-shaped, stunted, and at the cutting edge there is a notch in which the dentine is exposed. There is a tendency to hemorrhage, sometimes purpura hemorrhagica. The child may show increasing malnutrition, and look like a wrinkled old man. The cry is harsh and piercing. Other late symptoms are keratitis; iritis, impaired hearing from ear affections, periostitis and splenic and hepatic enlargement. The syphilitic who outlives childhood has a stunted appearance — undersized, and appears much younger than he really is. The forehead is prominent, the frontal bases are marked, the bridge of the nose depressed, the tip turned up. This condition has been termed infantilism.

Diagnosis. — During the primary stage there can be little doubt as to the diagnosis. Later, with a clear history of syphilis, the diagnosis is easy, but negative statements as to primary infection are not always to be relied upon. Often a primary sore has been so slight as to be entirely overlooked, or has been masked by a gonorrhea. Careful inquiry must be made not only as to a primary sore, but also as to the characteristic secondary symptoms — sore throat, rashes, alopecia, etc. Search should also be made for the remaining scars of chancres or buboes, and for periosteal nodes. The following excellent table of differential diagnosis between chancre and chancroid prepared by Dr. L. W. Beebe, is taken from Gatchell's "Pocket Book of Medical Practice."

Chancre.

Appears, 10 to 90 days; average 3 weeks after exposure.

Generally single; if multiple, all appear at once; *not autoinoculable*.

Begins as an *erosion* or a *papule*; remains an erosion; may ulcerate if irritable or inflamed.

Edges, adherent and sloping toward the center.

Base, smooth, shiny and red; sometimes gray, black or livid; covered with granulations.

Chancroid.

Appears, 2 to 5 days after exposure.

Single or multiple; *autoinoculable*; others may appear later.

Begins as a pustule or an ulcer; remains an *ulcer*.

Edges, sharp-cut, as if punched out, everted or undermined.

Base, uneven, sloughy, yellow, tawny; sometimes as if covered with a false membrane; no granulations.

Discharge, scanty; serous or sero-sanguinous; not autoinoculable; sometimes absent.

Induration marked; sharply defined; does not shade off into the surrounding tissues; may greatly outlast the erosion.

No tendency to invade surrounding tissues; soon becomes circumscribed; phagedena seldom occurs.

Bubo -- Glands always enlarge; 1st or 2d week; multiple, small, slow growth; *painless*; the skin above is normal; *rarely suppurate*.

Progresses slowly.

Prognosis.— Local lesion, good; circumscribed. Constitutional symptoms follow.

Discharge, profuse; purulent; offensive; autoinoculable.

Induration, purely inflammatory if present; shades off into the surrounding tissues; disappears with the ulcer.

Tendency to invade the surrounding healthy tissues. Phagedena not uncommon.

Bubo.— Glandular enlargement in one third of cases; generally after three weeks; single; large; rapid growth; *painful*; skin red and adherent; *often suppurate*.

Progresses rapidly.

Prognosis.— Local lesions more serious; tend to spread; no constitutional symptoms follow.

Hereditary syphilis can only be identified from the family history and the characteristic symptoms.

Prognosis.— Syphilis was once considered an incurable disease, but that day has passed. It can always be radically cured and thoroughly eliminated from the system by early and persistent treatment. Only carelessness in hygiene and a neglect of proper therapeutic treatment can be responsible for a lack of cure. Cases that have reached the tertiary stage with organic visceral changes are not always amenable to treatment, and positive destruction of tissue can not be entirely overcome. Even here wonderful results are accomplished by proper treatment, as in no other disease do we find serious lesions so comparatively easy of control, though their consequences often remain permanently. The chief point is that persistent constitutional treatment will certainly eradicate syphilis from the system, and render its hereditary transmission impossible.

VISCERAL SYPHILIS.

1. **Syphilis of the Brain.**— This may develop during childhood as a form of hereditary syphilis, but usually it is a late tertiary manifestation of the acquired form. In rare instances it develops within a year or two after the primary sore, but in most cases it does not occur for ten or twenty or even thirty years. It is most apt to follow in cases where the symptoms of the primary and secondary stages, especially the latter, have not been marked, or have even been entirely overlooked.

The disease is most often characterized by the formation of gummatous tumors, ranging in size from a pea to a hickory nut. They are usually multiple, and are situated either in the cerebral hemispheres or on the pons, and are attached to the pia mater, sometimes to the dura. When they press upon the meninges or cortex, we have the symptoms of acute or chronic meningitis or those of cortical tumors. If the gummatous condition involve a blood vessel, there may be a consequent weakening of the vessel walls, resulting in rupture and intracranial hemorrhages. Meningitis may also arise, secondarily, from syphilis of the bones of the cranium.

The symptoms consist chiefly of those characteristic of cerebral tumors. There may be headache, optic neuritis, vomiting, and convulsions, paralysis, or epileptic seizures. The common psychical disturbances preceding are severe headache, worse at night, alteration of character and loss of memory, often followed by violent delirium. In some instances a sudden and violent delirium is the first symptom. Syphilitic stupor may follow, the patient remaining for hours at a time in a torpid, dazed condition, which if not relieved, may pass into profound coma, which is usually fatal.

There may be presented the usual symptoms of general paralysis—dementia paralytica, or there may be a sudden hemiplegia, without loss of consciousness, and often without the usual exciting cause of either cerebral hemorrhage or tumor. Transitory or fugitive paralysis of irregular distribution may result from a functional brain disturbance from the diminished blood supply through the narrower arteries. The appearance of epilepsy may be preceded by the psychic manifestations already mentioned.

The *Prognosis* is usually described as favorable. Such, however, has not been my experience. The disease is a serious one, very frequently fatal, and the prognosis should be guarded. When there is an absolute destruction of brain tissue the prognosis is hopeless.

The *Diagnosis* of cerebral syphilis can only be positively ascertained from a clear syphilitic history, which is not always easily obtained.

2. **Syphilis of the Liver.**—Probably the liver more than any other organ suffers from syphilitic disease. It may occur from hereditary syphilis or constitute a tertiary lesion in the acquired form.

Syphilis of the liver may occur as a (1) diffuse syphilitic hepatitis; as a (2) syphilitic perihepatitis, or as (3) gummata.

(1) *Diffuse Syphilitic Hepatitis.*—This form occurs mostly in hereditary syphilis. The liver is large, firm and resistant. Its color is a grayish-yellow, often resembling amyloid disease. Gummata are usually present. The symptoms usually resemble those of cirrhosis.

(2) *Syphilitic Perihepatitis*. — There is a thickening of the capsule, and cicatricial bands dip into the substance of the liver, particularly along the portal canals, forming fibrous scars that cause considerable deformity. There are usually pain and tenderness.

(3) **Gummata**. — These may in children or adults form hereditary syphilis. In acquired syphilis they are rarely present under two years after the primary infection. They may occur as miliary gummata, especially in hereditary cases, or as nodules varying in size from that of a pea to that of a lemon. They are most apt to be located on the convex surface of the organ, especially near to the suspensory ligament. In the early stage they are reddish-gray and of a translucent appearance. Later their centers may become cheesy, fibrous or puriform. Smaller gummata undergo fibroid transformation, and when numerous, produce extensive deformity of the liver. As a rule nodular inequalities of surface are recognized. Usually no symptoms are produced until pressure or contraction interferes with the portal circulation, when the ordinary symptoms of cirrhosis will be manifest — ascites, enlarged spleen, gastrointestinal symptoms and slight jaundice. When secondary amyloid degeneration has occurred, as sometimes happens, the symptoms of amyloid disease are present. There is usually localized pain and tenderness over some spot in the right hypochondrium.

The *Prognosis* is grave, though many cases entirely recover.

The *Diagnosis* is made by the exclusion of an alcoholic cirrhosis, the presence of a syphilitic history, either hereditary or acquired, and the presence of an enlarged and irregular liver.

3. **Syphilis of the Digestive Tract**. — Gummata may develop in the tongue and in the throat. They may also occur in the esophagus, usually resulting in stenosis. Syphilitic ulcers may occur in the stomach and intestinal tract. The rectum is the chief seat of invasion, when gummatous infiltration is comparatively frequent, resulting in a funnel-shaped stenosis, which narrows from below upward. Ulcers, both specific and from pressure of feces, may be present. This condition occurs most frequently in women. The symptoms are similar to those of stenosis of the rectum, resulting from non-specific causes. Death results from asthenia or from some complication, such as perforative peritonitis.

The *Diagnosis* is made chiefly by the syphilitic history and the funnel-shaped stenosis.

4. **Syphilis of the Larynx**. — Laryngitis may occur as a secondary symptom, but more important are the laryngeal lesions arising during the tertiary stage. There is a chronic laryngitis, with gummatous infiltration, which may undergo resolution or ulcerate and

destroy the deeper structures. Subsequent cicatrices may cause serious deformity, sometimes resulting in laryngeal stenosis.

5. **Syphilis of the Lungs.**—This may occur, but is a rare disease. Three distinct forms are recognized: (1) *White Hepatization of Fetal Pneumonia*.—This occurs in the newborn, chiefly in the stillborn, and is of no clinical interest. (2) *Gummata*.—These may occur as a late tertiary condition. They are widely distributed, being most numerous at the bases of the lungs, and are usually surrounded by a zone of consolidation. They may soften and ulcerate forming small cavities, or may undergo fibroid change with cicatrization, leading to recovery. General bronchitis, thickened pleura and interstitial pneumonia may result. (3) *Syphilitic Fibroid Pneumonia*.—This is accompanied by the usual signs of fibroid change, and irregular areas of hepatization, the bases of the lungs being chiefly involved. Syphilis of the lungs often results in pulmonary tuberculosis.

6. **Syphilis of the Circulatory System.**—*Syphilis of the heart* may occur (1) as *gummata*, which attack chiefly the walls of the left ventricle; (2) *Fibro-sclerotic Myocarditis*; and (3) *syphilitic endocarditis*.

Syphilis of the arteries may exist as (1) an *obliterating endocarditis*, and (2) a *gummatous periarteritis*. "Syphilis is believed to play an important rôle in arterio-sclerosis and aneurysm." (Osler.)

7. **Syphilis of the Kidneys.**—This occurs chiefly in the tertiary stage, and is usually gummatous. The condition can not be recognized clinically. Amyloid degeneration is not uncommon.

8. **Syphilis of the Joints.**—Synovitis may appear temporarily during the secondary stage. Perisynovial gummata are sometimes present. Gummata or nodes about the joints may cause arthritis. True chronic synovitis is most common.

9. **Syphilitic Orchitis.**—This may occur as an interstitial inflammation with fibro-sclerotic change, leading to atrophy, or gummata may be present, usually manifested by hard nodular swellings in the substance of the testicle, resembling tuberculous disease. I have now under treatment an interesting case of syphilitic orchitis. One testicle having been already removed, the patient came to me with an urgent appeal to save the remaining organ, which had become involved since the removal of the other testicle. He had been positively assured by several distinguished surgeons that such salvation was impossible, and that the greatly enlarged member should be extirpated without delay. After assuring myself of the correctness of the diagnosis of syphilis by means of microscopical examinations of the removed testicle, I gave a favorable prognosis, and placed the patient upon

Iodide of Potash. Less than three months after the beginning of the treatment the patient reported to me by mail that the testicle had regained its normal size, and so far as he could see, was entirely cured. Six months later, and up to the date of this writing, the patient reports no return of the disease, and has ceased taking the remedy.

Treatment of Syphilis.

Prophylaxis. — To prevent the hereditary transmission of syphilis, syphilitic patients should not marry until three years have elapsed since the infection. Even then there must have been thorough treatment, otherwise there can be no definite period of safety estimated. If at any time there is a fresh outbreak of symptoms, the period preceding a safe marriage is correspondingly prolonged. A syphilitic mother should receive treatment throughout pregnancy, and treatment should be continued with the child. A healthy mother should not suckle her syphilitic offspring on account of the danger of infection to herself. Acquired syphilis is only prevented by personal purity. All governmental regulations in the way of inspection are impracticable and comparatively useless. Countries where such regulations are attempted, show as great a number of syphilitic cases as do those where no such attempt is made. The disease is alarmingly on the increase throughout the world, and pervades all classes of society, being no longer largely limited to the lower classes and to those who are well known to be patrons of prostitutes, while with the latter it is well-nigh universal.

To prevent inoculation from accidental sources, the latter being not uncommon, especially among surgeons, great care should be exercised in thoroughly cleansing and sterilizing all instruments used on suspected cases, and in handling syphilitic lesions, especially where there are abrasions on the fingers or hands. After treating such cases the hands should be thoroughly disinfected, and any breaks on the surface should be cauterized with nitric acid.

Hygiene. — Excesses of all kinds should be avoided. The diet should be liberal and of a nourishing character, but simple and easily digested. Fruits and acids in general need only be interdicted when the patient is taking mercury in appreciable doses. Alcohol and tobacco should be absolutely prohibited. The use of the latter greatly encourages the presence of lesions upon the mucous membrane of the mouth and throat. The skin should receive careful attention. Daily bathing with friction is beneficial. Occasional Turkish baths are useful. So also are alkaline and sulphur baths. The Hot Springs of Arkansas have

acquired a world-wide reputation in the treatment of syphilis, which I consider undeserved. It is the strict hygienic methods and treatment adopted at these springs that benefit the patient, for a time at least, rather than any inherent specific virtues possessed by the waters.

Local Treatment of the Primary Lesion.—The old method of “burning out” the primary sore with caustic or acids is now, happily, almost obsolete. Nothing is gained by any such treatment. Only cleanliness and mild antiseptic applications are required. It may be politic and possibly beneficial to dress the sore with a one to two thousand solution of mercuric bichloride. Better still is to cleanse the sore and then dust it with boric acid, proto-nuclein (special), bismuth, nosophen, aristol or calomel. Iodoform is not necessary, and its odor renders its use undesirable. Some prefer to paint the lesion with collodion containing one to four grains to the ounce of mercuric bichloride.

Therapeutics.—By the old school, Mercury and the *Iodide of Potash* are considered specific, and are universally employed in appreciable doses, though the latter do not average as large now as in former years. They also employ Mercury in the form of inunctions and by fumigation. This method has of late been recommended in homœopathic text-books. It is pernicious and baneful in its character, and entirely useless, and should never receive the indorsement of, and much less be employed by, homœopathic physicians.

Mercurius is often indicated and useful in syphilis, especially during the secondary stage, but is by no means a universal specific. It is seldom beneficial during either the primary or tertiary stages. Dr. T. F. Allen strenuously objects to the use of Mercury in syphilis. He holds that while it is similar to the disease in a few general features,—ulcerations, destruction of bones, and nocturnal aggravations,—and while it is admitted that a person thoroughly saturated with Mercury will not contract syphilis, toxic doses preventing its development and inhibiting its farther development when once it may have become established in the system, that it is powerless to cure it, largely because the drug has no foothold in some of the very tissues which are the chief prey of the disease. Most important is the fact that syphilis always attacks the flat bones, while Mercury acts only upon the long bones. “The initial lesion of syphilis is totally unlike the characteristic ulceration of Mercury; and Mercury possesses none of the mental peculiarities of the disease.” He adds: “There are few sadder spectacles than a person whose flat bones are riddled by syphilitic holes, whose long bones are rotten with Mercury, and whose body is being destroyed piece by piece,

by the simultaneous activity of these two destructive agents." Dr. Richard Hughes also denies that Mercury produces symptoms essentially similar to those of syphilis. He says: "I can but conclude that Mercury has no essential similarity to the syphilitic poison, and can not be relied upon to neutralize its influence in the blood, or to combat it at every point of its attack." However, he recommends it for "certain local manifestations of the syphilitic poison to which it is thoroughly homœopathic, and of which it will always prove more or less curative. One of these is affection of the mouth and throat; another is the subacute inflammation of the periosteum. But its main use is when the local manifestations of the disease become destructive, when the eruptions take the form of impetigo or rupia, or when ulceration attacks the skin and mucous membranes."

Hahnemann recommended *Mercurius vivus* in that stage of the syphilitic disease where the chancre or bubo is yet existing, "one single minute dose of the best mercurial preparation being sufficient to effect a permanent cure of the internal disease, together with the chancre, in the space of a fortnight." He used it in the sixth and thirtieth centesimal dilution.

Dr. J. H. McClelland, in a paper on the "Homœopathic Treatment of Syphilis," read before the World's Homœopathic Convention, in 1876, says: "With singular unanimity, all schools—and times—have fixed upon Mercury as the great *antisymphiliticum*, not by chance or arbitrary selection, but by virtue of its specific relation to the complaint; by virtue of its being one of the few known medicines having the inherent power of inducing—in all their phases—conditions similar to those produced in the human body by the syphilitic virus." Helmuth, Goodno and many other homœopathic writers hold similar views. Dr. William B. Trites, in his masterly article on syphilis in Arndt's "System of Medicine," says: "It is, undoubtedly, *the remedy* for syphilis. Other remedies may be required to ameliorate this or that complication, but the final cure will result only after a course of this metal in some of its forms." My own experience is that Mercury, and especially the *solubilis*, is of exceeding great value during the secondary stage in most cases. The Iodides are of greater value during the late secondary and the tertiary stages. The various preparations are, as a rule, employed almost indiscriminately, each physician having his favorite. They are not usually individualized as they should be. Carleton says of Mercury in general that it "is indicated and especially efficacious in the chloro-anemia of syphilis, as well as in syphilitic fever, whether of the intermittent or catarrhal form; alopecia; pains in the bones are worse at night; round copper-

colored and red spots on the skin; vesicles; erythema; papules and scaly eruptions; small ulcerations, become covered with a crust, secrete a fetid pus; periosteum swollen; indurated and the skin over it unhealthy, with pain in the bone, restlessness," etc. He gives the following brief differentiation between the various preparations: "*Merc. sol.* is indicated in congenital syphilis; erythematous, papular and squamous syphilides, especially on the palms, the spots are red, and scale off; erythematous congestion of the pharynx and mucous membrane, syphilitic fever; all pains worse at night. The *Bin-iod.* is indicated for the Hunterian chancre, and the *Proto-iod.* for secondary syphilides, sore throat, alopecia, headache, etc. *Merc. cor.* for destructive, serpiginous ulcerations with ragged edges, eating rapidly; iritis; secondary syphilides; sore mouth and throat, especially when the uvula is swollen, red and elongated, with burning and violent constriction of the throat on any attempt to swallow liquids or solids, which causes a spasm and regurgitation of food; pulse quick and irregular; syphilis of internal organs. *Acid Nitrate of Merc.* will be of great benefit for the sticking pains in the throat, etc., with other mercurial symptoms.

The most advanced old school physicians recommend giving Mercury in small doses. The usual dose of the *biniodide* is $\frac{1}{16}$ of a grain, and of the *protoiodide* $\frac{1}{4}$ of a grain, three times a day. Most homœopathic physicians use about the second decimal. I have never found it necessary to go below the third decimal, giving it usually about three times a day. High-potency physicians claim much better results from the higher, and even highest potencies. Certainly we should employ the smallest dose possible necessary to a cure.

Kali iodatum.—This drug is used almost universally by the old school during the tertiary stage, but in doses larger than required. Homœopathists employ it in the secondary, and more especially the tertiary stages. It is generally considered to be of little value in the potentized form, but, nevertheless, is seldom required in the comparatively large doses usually employed. Until within the past year, and then only in one case of syphilitic orchitis previously mentioned, I have never used it stronger than the first decimal trituration or solution, and have been perfectly satisfied with the results I have obtained.

Trites says, "The most favorable time for the administration of the Iodide is after eating. We usually dissolve six grains of the salt in three tablespoonfuls of water, and direct a tablespoonful to be taken after each meal. If the result is not satisfactory, we increase the dose until a response is elicited, rarely having to exceed twenty grains in the

twenty-four hours." Goodno says that for "the tertiary lesions, ten grains three times daily will prove sufficient. In the case of nervous and visceral syphilis much more than this quantity is required. Oftentimes it must be administered in doses limited only by the patient's tolerance." I have no sympathy with such statements, especially when coming from homœopathic sources. Carleton says that "the best results are obtained, as a rule, by the administration of the drug in appreciable doses, gradually increased. It is generally given in a saturated solution, each drop of the solution corresponding to one grain of the drug. It should be given in milk after meals, the usual dose being from five to seven grains, although drachm doses every four hours have been administered successfully in cases of gummata of the brain. Sometimes in the intermediate stage, between the secondary and tertiary, what is known as the mixed treatment is frequently administered with gratifying results; it consists of a combination of Mercury and Iodide of Potassium." The use of Mercury and the Iodide of Potash combined is incompatible with the doctrines of homœopathy, and is, to say the least, unnecessary. As to the method of cure by this drug, there are conflicting opinions. Many regard it as strictly homœopathic to the usual manifestations of the tertiary stage, and sometimes of the secondary stage. Dr. Richard Hughes says that we can lay no claim to this action as being homœopathic. "It is one of the weakest points in our theory that we can not count upon the law of similars for the power of this remedy." Dr. Naden considers that "the Iodide of Potassium has two distinct actions :—

1st. The ordinary specific action to which we are surely guided by the pathogenesis.

2d. The power of destroying certain morbid germs, especially those which characterize tertiary syphilis.

3d. As a corollary to the 2d, the cure of tertiary syphilis by the Iodide of Potassium is therefore *specific, but not homœopathic*. Whether these conclusions are true or not, we must admit the efficacy of the drug. Trites says, "Some homœopathic physicians refuse to employ this remedy; I can only say of such that they do an unpardonable injury to their patients, for no other drug will relieve so quickly and so certainly in tertiary syphilis." The drug is useless in the primary stage and practically so in the secondary, though exceptions occur. According to Carleton, Kali iodatum "is indicated in all the tertiary lesions of the skin, gummatus infiltration of the internal organs, and frequently in some of the secondary conditions found in hereditary syphilis. In scrofulous, debilitated conditions; violent headache, with hard lumps on the head; alopecia; roseola, papular and pustular eruptions on the face,

scalp, chest and back, that on healing leave a cicatrix; tertiary syphilides; rupia; discolored ulcers; gummatous infiltration of the nervous tissue and the internal organs with their local and reflex symptoms; foul breath, sore throat; ulceration of the bones of the nose; ozena with greenish-yellow and exhausting discharge; ulcers eating deeply into the tissues and leaving large scars; gummatous infiltration of the bones and periosteum. These infiltrations have no fluctuations, but have a deep, doughy feeling, with throbbing, gnawing, burning, boring pains, which are worse at night; enlarged glands in the groin, neck, etc.; infiltrations of the soft tissues and bones; ulceration of bones." It may be added that Kali iodatum is particularly useful in old syphilitics who have been thoroughly saturated with Mercury — the Mercurio-syphilitic diseases. I have felt warranted in thus dwelling at length upon the use of Mercury and the Iodide of Potash in syphilis for the reason that they are so commonly employed and constitute the chief remedies in the treatment of the disease. However, other remedies sometimes indicated and required should not be overlooked. A few of these will be briefly mentioned.

Arsenicum (3x). — In late stages when a cachexia has developed, with great emaciation and debility, and for scaly eruptions, tubercular exanthemas and gangrene. Many prefer the Arsenicum Iodide.

Asafetida (30x). — Tertiary syphilitic lesions of the long bones; especially after the abuse of Mercury; gummatous deposits; jerking, drawing pains in limbs. Worse at night; ulcer of the skin with a thin, fetid, ichorous discharge, sensitive to touch.

Aurum (6x), — Especially useful in cases that have been thoroughly saturated with mercury; invaluable in the Mercurio-syphilitic disease. The flat bones and bones of the nose particularly affected. Caries of the nasal, palatine, mastoid and ossicular bones; ozena; otorrhea; nasal catarrh; angina, exostosis of the skull and other bones. The boring nature of the pains and nightly aggravation are especially characteristic. The bones are usually very sensitive to touch, ulcerated tissues give forth horribly offensive discharges; alopecia. Syphilitic orchitis.

Carbo animalis (6x). — Copper-colored eruptions, especially on the face; old buboes which do not heal, but remain hard and secrete an offensive ichor; glands in various parts of the body enlarged and indurated; venous circulation sluggish; hands and feet blue and cold.

Carbo veg. (30x). — Putrid ulcers, easily bleeding, with burning pains; copper-colored eruptions; tertiary syphilides; great debility and emaciation.

Corallium rubrum (3x). — Venereal ulcers on glans or prepuce exuding a yellowish moisture; chancres having a coal-red hue. Far-

rington says a combination of syphilis and psora. Smooth spots on body having a coral-red hue, changing to a coppery color.

Hepar sulph. (3x). — Especially after abuse of Mercury. Ulcers, sensitive to touch, fetid discharges, easily bleeding. Pains in bones of the head, worse at night and from pressure, tonsils swollen and hard; enlargement of the glands of the neck; caries of the bones, especially of the face, with a discharge smelling like decayed cheese.

Kali bichrom. (3x). — Syphilitic ulceration of fauces, surrounding parts of a coppery-red color. The ulcers are deep and circular as if cut out with a punch; scaly patches on the tongue; discharge of hard green mucus from the throat, coughed up with difficulty from the posterior nares in the morning; ozena, caries of the bones of the nose; syphilitic laryngitis with dry, hoarse, barking cough; nodes on the cranium with deep pain in the osseous tissue; pustular and other tertiary eruptions with deep ulceration.

Guntz, of Berlin, has reported wonderful cures with this remedy, and advocates the treatment of syphilis with it alone, excluding Mercury entirely.

Mezereum (3x). — Mercurio-syphilitic diseases of the periosteum, periostitis, nodes, periosteal rheumatism; intense burning pains in the bones, worse at night and in damp weather; exostoses; ozena; sore throat, fauces dark red, burning sensation and raw pain extending from pharynx halfway down the esophagus, also involving the larynx, with dryness, hoarseness, etc., sometimes ulceration. The sore throat is chronic, being aggravated every winter. Mezereum has proved of great value in relieving the nightly bone pains of syphilis.

Nitric acid (3x). — A remedy of great value in mercurio-syphilitic disease. Probably of little value in syphilis where Mercury has not been abused. Secondary syphilides, especially on the face; ulcers with gray, everted edges, readily bleeding; ulceration of the genitals of both sexes; superficial chancre-like, or deep and ragged; bleeding easily; chancres after Mercury, with exuberant granulations, condylomata, exuding an offensive moisture; discharges from ulcers and sores offensive and corrosive; splinter-like pains; squamous eruptions; deep, bleeding fissures at corners of mouth; fetid breath; mucous patches covered with well-marked white deposit; ulceration of the nostrils and throat with discharge. Ulcers and gummata of the mouth, uvula, pharynx and fauces.

Phytolacca (1x). — A valuable remedy in primary and secondary stages; headache; periostitis; angina; eruptions, chancres; glands swollen; syphilitic rheumatism; pains worse at night and in damp weather; nodes on tibia, secondary syphilides and rupia; pains in long bones, worse at night.

Staphisagria (3x). — Secondary syphilis after the abuse of Mercury; pain, swelling and even suppuration of the bones and periosteum; syphilides; condylomata; mucous tubercles; gummatous ulcerations.

Stillingia (1x). — Painful nodes; severe bone pains, worse at night; ulcers; dark red, soft tubercular eruptions, ulcerating; shin eruptions forming crusts and scales; ozena; enlarged cervical glands.

Sulphur (30x). — Sometimes useful in late tertiary manifestations; copper-colored spots on forehead; persistent indurated buboes; various skin eruptions.

Treatment of Chancroid. — It is well understood that the chancroid, otherwise known as the soft chancre, is a local infective lesion transmitted by sexual intercourse, and characterized by ulceration, local glandular involvement and often by suppuration, but is never followed by constitutional symptoms, and is therefore non-syphilitic.

Local Treatment. — The ulcer should first be washed with a mild antiseptic solution, then dried and cauterized with carbolic acid, chromic acid or the nitrate of silver. Afterward it should be again washed occasionally with a mild antiseptic solution, dried and then dusted with calomel, aristol or nosophen.

To the bubo in the first stage apply hot fomentations. If the swelling is not thus aborted, paint the part with tincture of Iodine, or Ichthyol with glycerine — twenty per cent. If pus forms, incise and curette, then wash out with an antiseptic solution, and pack for twenty-four hours with carbolized gauze.

The usual remedies are Bell. (3x), Merc. sol. (3x), Hepar sulph. (3x) and Silicea (6x) according to indications.

LEPROSY.

Definition. — A chronic infectious disease characterized by tubercular nodules in the subcutaneous and submucous tissues and by changes in the nerves.

Pathology. — The bacilli lepræ are present in all cases. They are found in the tuberculous nodules, which consist of lymphoid, epithelioid, and giant cells, surrounded by a layer of connective tissue, and located in the subcutaneous and submucous tissues. They project from the surface, and either undergo caseation, and are absorbed, or become obliterated by dense connective tissue, or, more often, break down and ulcerate. These ulcers may heal in one direction while spreading in another, and in healing leave cicatrices. In the late stages of the disease the liver, spleen and lungs may be involved.

In the anesthetic form a neuritis is established, followed by atrophy, degenerative changes and anesthesia.

Etiology.—This disease occurs chiefly between the twentieth and fortieth years of age, but no age is exempt. Hereditary transmission is possible, but such cases are very rare. Before the general adoption of the microbic theory of origin the disease was supposed to be caused by eating spoiled fish or vegetables. No climate or country is exempt, but leprosy seems to thrive best in tropical countries, especially in India. It also exists extensively in the Sandwich Islands and in China. It is common in Africa, Brazil, Norway, the Baltic provinces of Russia, West India Islands, Mexico and in certain parts of Central and South America. Numerous cases have occurred from time to time in this country, having been introduced through the seaports of the Atlantic and Pacific coasts and the Gulf. On the Pacific coast the disease occurs chiefly among the Chinese. It is generally admitted that the specific cause of the disease is the bacillus lepræ, discovered by Hansen in 1880. This organism closely resembles the tubercle bacillus. The disease may be transmitted by contact, but in most instances direct inoculation is necessary, as in syphilis, and, as in the latter disease, is most often transmitted by sexual congress. Cracks and abrasions in the skin favor its transmission, which may also occur through vaccination.

Symptoms.—Two forms are recognized, the tubercular and the anesthetic. These may occur separately or be combined in the same patient. However, neither form runs its entire course without developing more or less of the pathology and symptoms of the other variety.

The period of incubation is uncertain. It may, from virulent inoculation, be very brief, but the usual period is supposed to be two or three years. Frequently for a year or two prior to the outbreak of the disease the patient will have more or less fever of an intermittent type, which is often mistaken for malarial fever.

At first there appears on the skin a patchy erythema, which is seen oftenest on the face or upon the exterior surfaces of the arms and knees. These patches assume a brownish tinge from pigmentation, and when the disease progresses no farther, it is designated as "macular leprosy." In some cases the pigmentation may entirely disappear, leaving white anesthetic spots. This condition is designated as "white leprosy." In most cases tubercular nodules develop, varying in size from a pea to a walnut. They are dusky-red or brownish in color, and may appear on any part of the body excepting the scalp and in the mucous membranes, especially of the mouth, throat, larynx and conjunctiva. They may coalesce which occurs most markedly on the face causing great, irregular thickening of the skin and consequent distortion of the features, to

which the term "leontiasis" has been applied. These nodules may remain for years, and in some cases partially or entirely disappear, but as a rule they, sooner or later, break down and ulcerate. Healing takes place slowly and leaves marked cicatrization and deformity. This is only rendered more conspicuous by the deformity which frequently occurs, resulting from loss of substance about the eyes, nose, mouth and ears. In some cases the fingers and toes fall off. The eyeball is often totally destroyed. The ulceration often involves extensive areas, which are frequently covered with crusts. Local symptoms may arise according to localities chiefly involved. The eyebrows usually fall off. There may be ozena, and if the larynx be involved, hoarseness and aphonia. Death may result from the deep destruction of tissue in the pharynx and larynx, from secondary pneumonia, or from general exhaustion and asthenia.

Anesthetic Leprosy.— In this form the nerve trunks are involved. The peripheral nerves become infiltrated, and are converted into thickened nodular cords which may even be felt under the skin. These are at first hyperesthetic and the seat of neuralgic pains, but later become anesthetic, and the muscles they supply become wasted. Yellowish-white, scaly patches are present on the trunk and extremities, and at first only their centers are anesthetic, but later the loss of sensation spreads until large areas are invaded. Trophic changes are usually quite marked. At first minute bullæ appear on the arms and legs. These may be succeeded by those of much larger size. These burst and usually leave extensive and destructive ulcers, often causing a claw-like deformity of the hands and fingers, and sometimes the fingers and toes drop off. The destructive processes produce great deformities, such as contractures, exposure of bones, ankylosis, etc.

Diagnosis.— In advanced cases of either form there is little difficulty in diagnosis. The fact is that in a very early stage there is danger of mistaking the disease for malaria as has already been mentioned. The anesthetic form resembles some varieties of scleroderma, but the trophic changes are much greater. The bacillus resembles too closely the tubercle bacillus to make it safe for diagnostic purposes.

Prognosis.— The final prognosis is hopeless, but in the early stages much can often be done by careful hygienic measures to prolong life, and render it more comfortable. The course is chronic, often lasting many years. The average duration of the tubercular cases is from eight to ten years; of the anesthetic cases, fifteen to twenty years.

Treatment.— The treatment is purely symptomatic, such remedies being prescribed as are required by the indications from time to time. The remedies coming nearest to meeting the general conditions of

leprosy are *Arsenicum* and *Hydrocotyle*. Above all, however, is the importance of hygienic measures. Pure, fresh air, good food, cleanliness and proper sanitary surroundings are indispensable. The segregation of lepers should be practiced whenever possible. It has already diminished the number of cases, and probably if it could be persistently put in practice in all cases, would ultimately stamp out the disease.

GLANDERS.

Synonym.—Farcy.

Definition.—Glanders is an infectious disease of equines, which may be communicated to man, as well as to other of the lower animals, not including cattle. There are two forms, true glanders and farcy. The former is characterized by nodular growths in the nares, the latter by nodular growths under the skin.

Pathology.—The lesions consist of new growths, usually nodular, rarely diffuse, composed of epithelioid and lymphoid cells among and in which are found the specific bacilli,—the bacillus Mallei. According to Virchow these lesions are really a variety of infective granulomata. The nodules soon break down, forming ulcers when on mucous surfaces (glanders), and abscesses when the subcutaneous tissues are involved (farcy). Deep tissues and the internal organs may be invaded.

Etiology.—The specific cause of glanders is the bacillus Mallei, a short, non-motile micro-organism closely resembling the tubercle bacillus, but is shorter and thicker. Inoculation with the bacillus causes the disease in both horse and man. The disease is acquired in man by the nasal discharges from the horse coming in contact with an abraded surface, or more rarely by inhaling desiccated discharges. It therefore occurs almost exclusively among hostlers or others who care for horses. The disease may be transmitted from man to man.

Symptoms.—The period of incubation is from three to five days, but may be longer. The disease may be either acute or chronic.

Acute Glanders.—There is at first redness and swelling of the nasal mucous membrane at the point of inoculation, with burning and dryness, and inflammation and swelling of adjacent lymphatic glands. The patient complains of languor, intense headache and pain in the limbs, and has considerable fever, the condition often being mistaken for the onset of typhoid fever. Nodules soon form, and ulceration takes place as previously described. The discharge which takes place from the nose is purulent, blood-stained and fetid. The skin of the nose and face becomes inflamed, giving an appearance somewhat resembling erysipelas, and a bluish tumor forms covered with

vesicles. Usually a papular eruption appears on the face and also on the trunk and extremities, especially about the joints. This soon becomes pustular, the pustules drying up as fresh papules develop. The latter is said to be characteristic. The ulceration extends to the nasal septum, the mouth and pharynx, and even the larynx, lungs and other organs. Local symptoms then develop, according to the parts and organs involved. With these symptoms, those of acute farcy are quite likely to develop. The patient becomes greatly prostrated, abscesses form, there is a high temperature with pyemic symptoms, followed by a typhoid condition and death, which usually occurs in from eight to fourteen days.

Chronic Glanders. — This form is insidious in its onset, and often difficult to recognize. The local features are those of an intractable coryza with a fetid purulent discharge, and frequently resembles closely the syphilitic process. There may be a hoarse cough and other laryngeal symptoms. The general symptoms are vague and uncertain. Usually there are also subcutaneous nodules, with abscesses and ulcers, but without distinct inflammatory symptoms or involvement of the lymphatics. These cases usually recover unless the acute form supervenes, but they may persist for months and even years.

Acute Farcy. — A nodular swelling appears at the point of infection on the skin. This is associated with an intense local inflammation which becomes rapidly diffused, soon followed by the development of more nodules, which suppurate and form abscesses; these often follow the course of the lymphatics, and are most numerous about the joints. The abscesses break and discharge, leaving irregular deep ulcers with a grayish infiltrated floor, which may become necrotic. Often there are swelling and suppuration of the joints, and the muscles may be the seat of abscesses. The nose is not involved, unless glanders be combined. The constitutional symptoms are those of acute pyemia. Death is the almost invariable termination.

Chronic Farcy. — Granulomatous tumors form under the skin, generally about the joints. These break down and form abscesses, but the process is slower, is devoid of acute inflammatory symptoms, and the lymphatic glands are not markedly involved. Sometimes the resulting ulcers extend in depth until they involve the tendons and even the bones. The general symptoms are practically the same as those of chronic glanders. Chronic farcy offers the most favorable prognosis, as most cases recover under appropriate treatment in from one to two years, but death may result from extensive systemic infection or from intercurrent disease.

Diagnosis. — Knowing the source of infection the diagnosis may be easy, but otherwise it is extremely difficult and can only be determined by experimenting with pure cultures on the lower animals, especially the rabbit or the guinea pig. The animal usually dies within twenty-four hours after inoculation.

Treatment. — *Prophylaxis* — Infected animals should be killed at once. If it be known that any of the discharge has been lodged on a mucous surface, the part should be thoroughly irrigated with a solution of permanganate of potash or a ten-per-cent solution of carbolic acid. During the course of an attack all discharges should be promptly burned.

General Treatment. — This consists in the application of surgical measures and the free use of antiseptics. The nasal passages should be kept cleansed with borolyptol or some other mild antiseptic. Ivins recommends "a ten- to twenty-per-cent carbolic-acid solution, red permanganate of potassium solution, or fifteen volume peroxide of hydrogen." As to remedies I have no confidence whatever in *Kali bichrom.*, and other remedies recommended upon purely theoretical grounds. Of these, probably Arsenicum and the snake poisons are of most value. I think the therapeutics of the acute forms are practically the same as that of pyemia, while in the chronic forms we should think of *Arsen.* (3x), *Hepar sulph.* (3x), *Iodine* (3x), *Merc. sol.* (3x), *Phos.* (3x), *Silicea* (6x) and *Sulphur* (30x).

ACTINOMYCOSIS.

Synonyms. — Big-jaw, Lumpy-jaw, Swelled Head.

Definition. — An infectious disease of cattle, communicable to man, caused by the actinomyces or ray fungus.

Pathology. — There is present a tumor-like mass appearing identical to sarcoma or tubercle, but invariably containing the characteristic ray fungus. The mass is made up of a conglomeration of individual growths which singly are no larger than a millet seed. The tumor is generally yellowish and of a tallowy consistence, and presents nodular projections upon the surface. They have a tendency to break down and suppurate, resulting in abscesses and sinous fistulæ. The surrounding tissues are deeply inflamed, but the lymphatics are not involved. The usual seat of the disease is about the jaw and the head, but it may affect the lungs and less often the skin and the brain. In man the disease assumes very closely the form of a chronic pyemia with metastatic abscess formation.

Etiology. — Actinomycosis is caused by the ray fungus which appears as a small, yellowish granule from 1-25 to 1-12 inch in diameter.

Under the microscope the granule is resolvable into conical threads radiating from a center to which they are attached by very small nodes, the other club-like ends being outward. The organism is only cultivated with difficulty. The disease can be produced by the inoculation of cultures as well as by direct inoculation of the fungus. Infection takes place usually through the mouth, teeth and pharynx, less often through the respiratory organs and the skin. As the ray fungus has been isolated from vegetables, it is presumed that infection occurs in animals while feeding on vegetable matter. Bostroem thinks that the poison enters the economy by means of the infected grains of some cereal.

Symptoms. — The jaw is the usual seat of the disease, which is swollen at the angle, and is difficult to open. The bone is involved, resembling osteo-sarcoma. The swelling may extend to the face and neck and result in sinuses resembling those associated with bone necrosis. The diseased process may involve the tongue and fauces, and may extend downward involving the esophagus, lungs, heart, liver and intestines. If the upper jaw is primarily affected, the disease may extend upward, and involve the brain. Primary actinomycosis of the brain is of exceedingly rare occurrence. Metastatic abscesses may occur in the lungs, liver and intestines due to the direct transfer of a portion of the fungus.

Pulmonary Actinomycosis is usually secondary, but may occur primarily. The symptoms are those of bronchitis—fever, cough, expectoration and emaciation. The actinomyces are found in the sputum, which is often the only method of diagnosis from bronchitis and later from pulmonary tuberculosis, the course and symptoms of which are resembled. The posterior and lateral parts of the lungs are affected rather than the apices. In rare cases small nodules are scattered through the lungs, resembling tuberculosis.

In others there may be broncho-pneumonia or lobar pneumonia with large abscesses resulting.

Intestinal Actinomycosis may be either primary or secondary. It is characterized by the usual lesions in the submucous tissues, usually with ulceration, perforation and consequent peritonitis. Periceal abscesses may also occur. The symptoms are at first those of an intestinal catarrh, irregular attacks of diarrhea being the chief feature. The organism may be found in the stools.

Cutaneous Actinomycosis is of rare occurrence. There are slowly growing tumors on the skin which suppurate and leave intractable ulcers in which the ray fungus is found.

Diagnosis. — The only positive method of differentiation from sarcoma, tubercle or chronic pyemia, is to examine for the actinomyces.

According to Warren, sections may be stained in Ziehl's carbol-fuchsin from five minutes to half an hour, and then decolorized in a one-percent picric-acid solution until the whole section has a yellow appearance. Dehydrate and mount. The fungus appears as a brilliant-red astor, while the surrounding tissues are yellow.

Prognosis.—Local actinomycosis that is recognized early and properly treated usually results favorably. Spontaneous recovery does not occur. Pulmonary and other internal forms are almost invariably fatal. Those devolving pyemic conditions usually hasten to a fatal termination. The course is generally chronic, and lasts about ten months.

Treatment.—The treatment is chiefly surgical, though remedies recommended for pyemia should be consulted. Surgical treatment consists either in excision of the parts involved, followed by disinfection with an acid-sublimate solution, which is the best method, or in cauterization of the diseased masses and the opening and disinfection of abscesses and sinuses. Cures are reported from massive doses of the iodide of potash.

FOOT AND MOUTH DISEASE.

Synonyms.—Aphthous Fever, Epidemic Stomatitis.

Definition.—An acute infectious disease of the lower animals, especially of cattle, sheep, pigs and goats, and communicable to man, characterized by fever and the appearance of vesicles in the mucous membrane of the mouth and between the toes, and on the udders of cows.

Etiology.—A specific organism has not been isolated. Transmission may occur by contact with the vesicles, as in milking, but the disease is usually communicated through the use of milk from infected cattle or from butter and cheese made from such milk.

Symptoms.—The period of incubation is from three to five days, after which there is some chilliness, followed by fever, malaise and loss of appetite. Soon there develop vesicles containing a yellowish serum upon the tongue and inner surface of the lips. There is a sensation of heat and burning in the mouth, and the mucosa is red and swollen. The latter may be so great as to interfere with speech and deglutition. There is also copious salivation. Sometimes gastrointestinal symptoms are present. Vesicles may also appear between the fingers and toes and less often on other portions of the body. The hands are often extensively involved. In severe cases hemorrhages may occur.

Diagnosis.—The chief diagnostic feature is the coincident vesicular eruption in the mouth and extremities, other parts of the body being usually unaffected. When the disease is prevailing among animals, the diagnosis is more readily made.

Prognosis.—Recovery after a mild course of about a week's duration is the almost invariable rule. Young children, like young animals, if allowed to subsist upon the infected milk, may die.

Treatment.—As a prophylactic measure, the avoidance of infected milk is obviously imperative. Care as to personal contact with the vesicles should also be observed. Diseased cattle should be isolated. The treatment is practically the same as that of aphthous stomatitis.

MILK SICKNESS.

Synonyms.—Trembles, Puking Fever.

Definition.—An infectious disease characterized especially by trembling, vomiting, constipation and a peculiar fetor of the breath.

Etiology.—The causes are unknown. It prevails especially in the Western and Northwestern States, but is unknown east of the Alleghany Mountains. In the early days of the country it prevailed extensively and fatally, but advancing civilization and the cultivation of the soil seems to have almost caused its extermination. It affects the lower animals, chiefly cattle, especially calves, and lambs and colts. It is supposed to be communicated to man through milk, cheese and butter, and also flesh when used as food. It is most common in adults, and occurs most frequently in the late summer and autumn and in dry seasons.

Symptoms.—When occurring in cattle, there is an absolute rejection of food, the eyes become injected, the characteristic "trembles" occur, followed by convulsions and death.

In man there is a sense of uneasiness and discomfort for two or three days, followed by severe epigastric pain, constipation, nausea and vomiting, and a peculiar fetor of the breath. The constipation is especially severe and characteristic. The tongue is swollen and tremulous, there is intense thirst, but only moderate fever. Marked tremors or muscular twitchings occur. There is considerable restlessness and irritability, which may gradually pass into coma or convulsions, or a fatal typhoid state may supervene.

Diagnosis.—This is only positive when "trembles" is prevailing in cattle, and other diseases of a like character can be excluded.

Prognosis.—As a rule, favorable, but grave cases as already mentioned sometimes occur.

Treatment. — *Prophylaxis* consists in avoiding the use of infected food and milk. The general treatment consists in supportive measures — nourishing liquid foods and stimulants and the use of the indicated remedy, which is usually *Arsenicum*.

WEIL'S DISEASE.

Synonym. — Acute Febrile Jaundice.

Definition. — An acute infectious disease, characterized by jaundice, remittent fever, and muscular pains. It was first described by Weil in 1886.

Etiology. — It is supposed to be of microbic origin, but no organism has been isolated, and the exact nature of the disease is unknown. It occurs in males oftener than in females, and especially in butchers, laborers and brewers, and between the ages of twenty-five and forty. It is most common in the summer months, when limited epidemics may appear.

Symptoms. — The onset is sudden, being usually ushered in by a chill, followed by headache, pain in the back and muscles, and by fever, which is usually of a pronounced remittent type. The fever runs from ten to fourteen days, and terminates by lysis. Jaundice usually appears on the second day, and is generally of the obstructive form with clay-colored stools. The liver and spleen are both enlarged, and the former may be tender. The tongue is coated, and there may be vomiting and diarrhea. In grave cases there may be dizziness, confusion of the mind, and even delirium. The urine contains biliary coloring matter; sometimes albuminuria with casts, and even blood.

Prognosis. — The disease seldom results fatally.

Treatment. — This is purely symptomatic.

ANTHRAX.

Synonyms. — Malignant Pustule, Splenic Fever, Wool-sorter's Disease.

Definition. — An infectious disease caused by the anthrax bacillus, primarily affecting the herbivora, especially cattle and sheep, but transmissible to carnivora and to man, characterized chiefly by blood poisoning and the formation of a pustule or by edema, or in the internal form, by gastro-intestinal symptoms.

Etiology. — Anthrax is caused by the anthrax bacillus and its toxins. This is a rod bacillus, and is found in enormous numbers in the blood and tissues of the animal infected with anthrax, where it

multiplies rapidly by division. "In artificial cultures it grows in long threads, in the interior of which appear minute ovoid spores, which are loosed by disintegration of the bacilli, which have but a transient existence, while the spores are very tenacious of life." The latter live for a long time in the grass or on the surface of pasture land. When introduced into the system of animals, either by inoculation or inhalation, or from eating the infected grass, they develop into bacilli. Likewise in man, the disease is acquired either by inoculation, inhalation, or through the alimentary tract. Inoculation results from handling infected hides, wool and hair, or instruments, or by bites of flies or mosquitoes. The disease may be acquired by inhalations from infected skins or wool, or the alimentary canal may be infected from diseased meat. Naturally those most exposed, and consequently most often affected, are such as come in contact with affected animals, or workers who handle their hair or hides, herdsmen, stable hands, butchers, wool sorters, etc.

Symptoms. — The period of incubation is from one to five days. The disease occurs in an internal and an external form.

2. **External Form.** — This form manifests itself as (a) malignant pustule, which is the most common form, or as (b) malignant edema.

(a) *Malignant Pustule.* — This form occurs from inoculation, being most frequent on the face, hands or arms. A small papule first appears at the point of infection, accompanied by an itching and a burning, smarting pain, resembling often that from the bite of an insect. Soon a vesicle forms, which is filled with a clear, or, often, with a bloody serum. This ruptures, and leaves a characteristic dark-brown, bluish or black scab, the original papule becoming swollen and indurated, and surrounded by an areola of miliary vesicles. A brawny edema appears which becomes extensive, often involving within thirty-six hours the whole surface of the affected part, the lymphatics becoming inflamed, swollen and painful, and connected with the pustule by red lines. Meanwhile the central scab rapidly undergoes disintegration. Constitutional symptoms from the infection are manifest in all but very mild cases. Fever, prostration, sweats, enlarged liver and spleen, dry tongue, delirium, coma and collapse, death resulting in from four to eight days. In mild cases when general infection does not occur, there are no constitutional symptoms to speak of; the edema subsides, leaving a granulating surface.

(b) *Malignant Edema.* — This form begins in the eyelids and extends to the head, hands and arms. There is extensive swelling, especially in regions where there is much loose connective tissue, but there is no change in the color of the skin. No pustule or scab forms, but an

extensive gangrene frequently results. Constitutional symptoms are present early, often preceding the local manifestations.

2. **Internal Form.** — This form is manifest either as (a) intestinal mycosis, (b) wool-sorter's disease, or (c) rag-picker's disease.

(a) *Intestinal Mycosis.* — This form of anthrax is caused by eating infected meat, and is liable to affect a number of people in the same community or family at the same time. The patient complains of languor, headache, loss of appetite and pain in the limbs, followed usually by a chill, after which there is fever, pain in the head and back, with severe gastro-intestinal symptoms, vomiting and diarrhea. The stools often become bloody, and hemorrhages may occur from outlets of the body. Malignant pustules may form on the skin. There may be dyspnea and cyanosis, and often great restlessness, which may end in delirium and convulsions. Death in most cases results from heart failure, and is preceded by collapse. This form of anthrax is almost invariably fatal.

(b) *Wool-sorter's Disease.* — This form occurs in factory operators who are engaged in sorting wool or hair, especially that imported from Russia or South America, and who necessarily swallow or inhale the dust arising therefrom. The onset is sudden, beginning with a chill, followed by fever with high temperature, pain, dyspnea, bronchitis and cough. In some instances there are gastro-intestinal instead of pulmonary symptoms—vomiting and diarrhea. The mind may remain clear and tranquil to the last, or delirium or convulsions may precede death. Some cases are rapidly fatal, death from collapse occurring within twenty-four hours. The usual course is from three to five days.

(c) *Rag-picker's Disease.* — This form is practically the same as wool-sorter's disease. It occurs among rag pickers in paper mills. Infection takes place through the respiratory organs, which receive the whole brunt of the poison, except so far as general systemic infection adds to the symptoms.

Diagnosis. — The external form is readily recognized if the history of exposure is plain, but in all cases the contents of the pustule should be examined for the bacilli. These are large and easily recognized.

The internal form often passes unrecognized unless the occupation of the victim leads to suspicion. As a rule the bacilli are not found in the blood until shortly before death.

Prognosis. — In general the prognosis is unfavorable. Prompt and radical surgical measures together with the well-indicated remedy may save many cases of the external form. Internal anthrax is usually fatal, but a small per cent of cases recover.

Treatment — In the external form the pustules should be excised, and the remaining raw surface be sprinkled with powdered bichloride of mercury, or treated with the galvano-cautery. Some prefer pure carbolic acid or nitric acid. To prevent the extension of the brawny edema, subcutaneous injections of a solution of carbolic acid may be employed about the pustule, and be repeated two or three times a day. In this form, as well as in the still more fatal form, the indicated remedy should be persistently administered. *Arsenicum* (3x) is the chief remedy. Also consult *Lachesis* (6.) *Anthriscinum* (30x) and *Secale* (3x).

HYDROPHOBIA.

Synonym. — Rabies.

Definition. — An acute infectious disease peculiar to carnivora and to a less extent to herbivora, communicable to man by inoculation, and characterized by intense tonic spasm beginning in the larynx and pharynx.

Pathology. — There may be no discoverable lesions farther than dilatation and congestion of the blood vessels and perivascular exudation of leukocytes. Minute hemorrhages may be found in the brain and spinal cord. These are especially marked in the medulla, but may also be found in the upper spinal cord, the pons and in the cortex of the brain.

Etiology. — The micro-organism of this disease has never been demonstrated. The virus is found in the saliva, and to some extent in other secretions. Pasteur found it also in the nerve centers and succeeded in transferring the disease by taking bits of brain substance or medulla derived from an infected animal, and inoculating them into healthy subjects.

The infection is usually communicated to man through the bite of a rabid dog, but may also be derived from the bite of the wolf, cat, skunk or fox. In rare instances the virus has been communicated by the cow and horse. Children are more readily infected than adults. Wounds about the face and head are most certain to cause infection. Next in order come the hands and upper extremities, and lastly the lower extremities. According to Horsley only fifteen per cent of those bitten become affected, probably because the virus is prevented by the clothing or some other cause from reaching the wound. It is said that the bite of the rabid wolf is most dangerous. The more severe and lacerated the wound, the greater the danger of infection.

Symptoms. — The period of incubation varies from six weeks to three or four months. Very young children may develop the symptoms

earlier. In rare instances two years are said to have elapsed before symptoms developed,—but these cases are not well authenticated. It is considered that if symptoms do not develop within three or four months after the bite, the victim is safe from the disease.

The symptoms may be divided into three stages:—

1. *Premonitory Stage.*—The melancholia, due to fear, that so often occurs may be manifested immediately after the bite, but can not be considered as a part of the premonitory stage. The latter develops about twenty-four hours before the onset of the disease, the patient having headache, sleeplessness, great anxiety, loss of appetite and sometimes darting pains radiating from the cicatrix, which may be congested and tender.

2. *Spasmodic Stage.*—The patient first experiences a slight difficulty in swallowing, due to spasm of the muscles of deglutition. The spasm soon extends to the muscles of the larynx, which contract upon the slightest irritation, especially from swallowing, or even from a noise or draught of air or from mental suggestion. This causes intense dyspnea and the emission of curious barking sounds. It is characteristic that the sight of water is dreaded by the patient, which gives to the disease its name,—hydrophobia. The contact of water with the throat causes frightful spasms of the laryngeal muscles. Even the saliva can not be swallowed, and dribbles from the mouth. The countenance expresses the greatest anxiety, due to the dread of the spasms and of impending death. Acute mania may accompany the spasms, but the mind is usually clear. There may be convulsive movements of the mouth, the patient snapping his teeth and ejecting the foaming saliva in every direction. The spasms often extend to and involve the muscles of the body. As a rule the temperature is elevated, but it may be subnormal. The pulse is somewhat accelerated and irregular. The symptoms occur in paroxysms, the patient being quiet during the intervals, but showing the most extreme anxiety and dread, not only for his own future, but also that he may cause harm to the attending friends and family. After each paroxysm there is great prostration, which each time becomes more marked. Fatal asphyxia may occur in any paroxysm. This stage lasts from one to three days, sometimes a little longer.

III. *Paralytic Stage.*—In this stage the patient is exhausted, there are no more spasms, and unconsciousness and coma supervene. Death occurs from cardiac failure in from twelve to eighteen hours.

In rodents and very rarely in man paralytic rabies occurs in which paralysis begins near the part bitten, and spreads until it becomes general, finally involving the respiratory centers, but there are no spasms or excitement.

Diagnosis. — On account of the easily obtained history of infection there is little trouble as to the diagnosis. Tetanus and hysteria often present somewhat similar symptoms, but there is a different history. There are, no doubt, cases of lyssophobia that pass for hydrophobia, and there are those who maintain that all cases are lyssophobia, and that no such a disease as hydrophobia exists. Such a contention is entirely erroneous. Lyssophobia occurs in neurotic temperaments, and sometimes proves fatal, but recovery is the rule. The patient soon gets well on being positively assured that the offending dog was not rabid. For this reason suspected dogs should not be killed at once, but safely confined until a positive diagnosis can be established. I am certain that in the large cities many "mad dogs" are killed every season that are not mad at all, but only suffering from the ordinary "fits" to which dogs and cats are so prone.

Prognosis. — Fully developed rabies is invariably fatal. It is claimed, however, that cauterization of the wound, and also preventive inoculations during the period of incubation, are often successful in preventing the disease.

Treatment. — The wound should be at once thoroughly cleansed and then cauterized with caustic potash. After this it should be kept open and suppurating for several weeks. If cicatrization takes place too rapidly, a strong solution of caustic potash should be applied. One of the most efficient methods of prophylaxis is the energetic application of suction to the wound, being careful that the operator has no carious teeth or abrasions of the mouth. When the wound is on an extremity, a ligature should be quickly applied on the proximal side. Dr. C. Hering advised the application of radiated heat, as hot as possible without actual scorching of the wounded part. For this purpose a hot iron may be used, a live coal, or even a lighted cigar, the heat being applied until the patient begins to shudder.

Preventive Inoculation. — Pasteur found that the virus could be obtained in a pure state from the central nervous system, and that the continuous inoculation of the virus from rabbit to rabbit increased its strength to a maximum virulence, while in a dry atmosphere it lost gradually its virulence, and finally became inert. An emulsion is made from the inoculated medulla of the rabbit, and this obviously can be secured in any grade of virulence desired. Dogs are first inoculated with a very weak virus followed by that of an increased strength from day to day until injections of the greatest virulence can be made with impunity, the result of which is that the complete immunity of the animal is established. The same method is now practiced in man with what is generally considered great success. The mortality of those bitten by rabid

animals and treated in this manner having been reduced to 0.60 per cent. Anders says, "The success of the Pasteur method is almost universally attested, and his own claims, that few persons properly inoculated subsequently suffer from rabies, are generally conceded." Unfortunately this treatment is practically available only at Pasteur institutes, which are not numerous in this country.

The patient should be removed from all causes of excitement, and kept as calm and hopeful as possible. As a rule, nourishment must be administered per rectum. With the disease established recourse must be had to inhalations of chloroform and hypodermic injections of morphia to relieve the terrible sufferings.

Many homœopathic remedies have been recommended by Hahnemann, Hering and others, but no conclusive benefits have been derived so far as I can ascertain. The chief remedies proffered are *Belladonna*, *Hyoscyamus*, *Stramonium*, *Cantharis* and *Lachesis*. Hering introduced *Hydrophobin*, which is theoretically popular with those who usually advocate this class of remedies, but its effectiveness has never been demonstrated.

TETANUS.

Synonyms. -- Lockjaw, Trismus.

Definition. -- An acute infectious disease caused by the tetanus bacillus, and characterized by painful tonic spasms, occurring in paroxysms, affecting first and chiefly the muscles of the jaw and neck (trismus), and later other muscles, more especially the extensors of the spine and limbs.

Pathology. -- There are no essential morbid changes. Probably the virus acts chiefly upon the mucous centers of the medulla and cord, where may be seen congestion, perivascular exudation, and granular degeneration of the nerve cells. There may be redness and swelling of the nerve trunks. According to Brown-Sequard, these are consequent upon an *ascending neuritis* starting from the wound. In tetanus of the newborn there may be inflammation of the umbilicus.

Etiology. -- Tetanus may be idiopathic, but usually it is the result of traumatism. It especially follows contused and punctured wounds of the hands and feet. Tetanus neonatorum results from a badly treated umbilical cord, and is more frequent among colored people. Tetanus may prevail as an epidemic among the newborn, and as an endemic in certain institutions and localities, probably because the soil and conditions favor the life of the bacilli. The disease is more common in hot climates, though exposure to cold and dampness is a recognized cause.

The bacillus appears as a delicate slender rod, swelling at one extremity to contain a shining spore, thus giving the appearance of a drum-stick. Pure cultures are only obtained with difficulty on account of the invariable presence of other bacteria. Injections of the germs, or even of the sterilized or filtered cultures cause a typical tetanus. Briege has isolated from tetanus cultures, distinct toxin and tetanin, which in the minutest quantity act on the nerve centers as does strychnia, causing convulsions and spasms.

Symptoms. — The course of tetanus may be either acute or chronic. In the former the period of incubation is about two weeks, although from one to two days constitute its limits. In those cases where symptoms do not develop until after fourteen days, the course is usually slower, and has been termed chronic.

The symptoms develop gradually. The patient may first complain of languor and headache, though in some cases a distinct chill marks the invasion. Usually there is only at the onset a tension and stiffness in the muscles of the neck and jaws, the mouth being opened with difficulty, but without pain. Gradually there develops the characteristic spasm of the muscles of mastication, and the jaws become locked. The spasm soon spreads to the muscles of the back of the neck, of the face and of the trunk. The cervical muscles become rigid, and the head retracted, the facial muscles immobile, giving a loss of expression to the features. Often the eyebrows are raised and the corners of the mouth retracted, producing a peculiar smile, known as the sardonic grin. The abdominal muscles feel like a board, and the whole trunk is inflexible, the body being entirely straight and rigid so that in moving or turning it the whole body moves like a wooden man. This condition is known as orthotonos. In some cases there is opisthotonos, the body being arched backward, so that the patient is supported only by the head and the heels. In other cases, but much less frequently, the body may be flexed forward (emprosthotonos) or curved to either side (pleurosthotonos). Whatever may be the form of spasm, the arms generally remain movable.

The tonic rigidity is more marked in some cases than in others, but in all it is interrupted at intervals by paroxysms of clonic spasms of variable duration causing the most intense suffering, oppressed breathing, dyspnea and cyanosis. In rare cases there is dysphagia (hydrophobic tetanus). The spasms may be so severe as to tear the rectus abdominalis and if the diaphragm be involved, the patient may not survive the second or third paroxysm. The paroxysms may be spontaneous, but in most instances are reflex, being produced by any external impression, however slight, such as noise, jarring, a breath of air, or even a light footstep. Spasmodic closure of the glottis may cause death by asphyxia,

but usually the patient dies from exhaustion, the intellect remaining clear to the end.

The temperature is usually about 101° to 102° F., but may go up to 104° F., or even higher. Sudden hyperpyrexia may occur, which is an ominous sign. The pulse is generally from 120 to 130, but in very severe cases it may become very rapid, weak and irregular. There is usually profuse perspiration. The urine may be suppressed and the bowels are usually constipated.

Rose has described a form of "head tetanus" following injuries to the head, and particularly to the face. In these cases there is trismus, convulsive dysphagia and paralysis of the facial nerve on the same side as the injury. Acute attacks are usually fatal in from one to seven days. Chronic cases usually show a milder course. General spasms are not marked, trismus being the principal symptom. The intervals between the spasms grow longer each time, and after a few weeks convalescence takes place, though relapses are common.

Diagnosis. — The predominance of trismus at the onset and the early presence of rigidity at the back of the neck, together with the usual history of a wound, especially on the hands or feet, generally renders the diagnosis easy. The disease may, however, be confounded with strychnine poisoning, hydrophobia or hysteria. In poisoning by strychnia there is no trismus, there is an absence of rigidity between the paroxysms, the muscles being relaxed, and the arms are involved. The spasms develop in their intensity at once, and do not follow the order of involvement described under tetanus. In hydrophobia there is the history of a bite, there is an absence of trismus, the individual paroxysms are more distinct, the psychic disturbance is characteristic, and convulsive dysphagia with respiratory spasm is the predominating feature. In hysteria there is usually a previous history of neurasthenia with more or less uterine and ovarian irritation, there are other hysterical symptoms, the spasms are not limited to special groups of muscles, there is no trismus, there is complete relaxation between the paroxysms, and the temperature and pulse are normal.

Prognosis. — About eighty per cent of traumatic cases die and fifty per cent of idiopathic cases. The prognosis is more favorable in children, though tetanus neonatorum is nearly always fatal. Chronic tetanus is more favorable than the acute form. The shorter the period of incubation, the less favorable is the prognosis.

Treatment. — Absolute quiet in a darkened room is of great importance. All sources of irritation should be carefully avoided. The diet must be nourishing, and must usually be administered per rectum, though in some cases the stomach tube may be used. If the heart's

action becomes weak, stimulants must be employed. Warm baths may be both beneficial in relaxing the spasms, and at the same time may prove grateful to the patient. The wound should be cleansed with hydrogen dioxide, then cauterized with bromine or nitric acid, and properly drained. Punctured wounds especially, which are the most common cause, should be thoroughly incised. Excision and even amputation may be advisable in some cases. The fact that infection begins locally renders these measures supremely important. During the paroxysms chloroform should be administered. The use of tetanus antitoxin has not yet been attended by such beneficial results as to warrant any dependence being placed upon it, though Lockwood says that "injection of the blood serum of such immune animals into persons suffering from tetanus has frequently been followed by a prompt recovery, while in almost all cases the severity of the disease has been modified greatly." It is claimed that remarkably beneficial results have followed the subcutaneous injection of a two-per-cent solution of carbolic acid.

Therapeutics. — Remedies have not proved very efficacious.

Nux vomica (2x). — Is probably the most important homœopathic remedy. *Strychnia* is the chief remedy employed by all schools of practice. The leading characteristics of Nux Vomica are that the spasms are renewed by the slightest touch, noise or other reflex irritation, and that consciousness remains unimpaired. The spasms produced by this drug very closely resemble those of tetanus.

Hydrocyanic ac (2x). — This drug is recommended by Hughes. Hemple says it will cure tetanic spasms with trismus. It is best suited to those cases where there is less reflex excitability than in Nux Vomica and the tonic spasms are more persistent.

Belladonna (3x). — Trismus; convulsive movements of the muscles of the face and extremities; great rigidity of the spine; painful constriction of the larynx and fauces, with choking sensation; sudden drawing together of body and limbs; difficult respiration; dilated pupils; strabismus.

Cicuta (2x). — This drug is said to be especially useful where the disease results from wounds on the head or face. Trismus; spasms of the esophagus; deadly paleness of the face; rigidity of the affected muscles; eyes fixed; opisthotonos; foaming at the mouth; spasms excited by the slightest touch or movement.

Also consult Stram. (3x), Passiflora (Tinct.), Gels. (1x), Conium (3x), Cuprum (3x), Curare (1x), Lauro. (1x), Physos. (3x), Phytolacca (1x) and Verat. vir. (1x).

SECTION VIII.

DISEASES OF THE MUSCLES.

MYOSITIS.

Definition. — An inflammation of muscular tissue, more especially of the connective tissue of muscles.

Varieties. — Rheumatic myositis (already considered in connection with rheumatism). Suppurative or purulent myositis (occurring secondarily to pyemia and, occasionally, to other acute infectious diseases, and has already been sufficiently considered in connection with those subjects). Infectious myositis; progressive ossifying myositis.

INFECTIOUS MYOSITIS.

Synonyms. — Primary Myositis, Acute Polymyositis.

Definition. — An acute or subacute inflammation of the voluntary muscles, of rare occurrence and of unknown etiology.

Pathology. — The muscular fibers of voluntary muscles are chiefly involved, and, to a less degree, the interstitial connective tissue. The muscles, at first firm and fragile, undergo fatty degeneration of the fibers with infiltration and hyperplasia of the interstitial tissue. One case showed only hyaline degeneration in varying degree, with involvement of the intermuscular tissue. Atrophy of the muscles may follow. The spleen is enlarged, and there is an irregular erythematous eruption, leaving behind a distinct pigmentation.

Symptoms. — The disease occurs most often in young people, more often males. The extremities are usually first involved, and later the trunk. The muscles are swollen, somewhat edematous, hard, stiff and tender, making locomotion difficult and painful. The edema may become general. An erythematous eruption, irregularly scattered over the trunk and extremities, is regarded by Löwenfeld as characteristic. It is sometimes followed by pigmentation. If the muscles of deglutition and respiration become involved, the condition is very distressing, and may cause a fatal termination.

Diagnosis. — As the symptoms greatly resemble trichiniasis, the disease has been called pseudo-trichiniasis. The diagnosis can only be positively made by microscopic examination. Multiple neuritis resembles myositis, but lacks the edema and swelling.

Prognosis. — The course of the subacute form of the disease is from three months to three years. Death is the usual termination, resulting most often from paralysis of respiration. In some instances death may occur from a complicating broncho-pneumonia or from heart failure. In the acute form most cases die within three or four weeks.

Treatment. — The general treatment should be similar to that of rheumatic myositis, with such modifications as the individual case demands. The strength should be supported by appropriate diet, which should be plain but nourishing. Alcohol is often valuable, both locally and internally.

The chief remedies according to indications are Bell. (3x), Bry. (3x), Gels. (1x), Ars. iod. (3x), Fer. phos. (6x), Kali iod. (1x), Phos. (6x), Phytol. (2x), Rhus tox. (3x), Silic. (6x), Sulph. (30x), Zinc (6x).

PROGRESSIVE OSSIFYING MYOSITIS.

Definition. — A rare form of myositis in which the affected muscles undergo progressive ossification.

Pathology. — The process may be localized, affecting only certain muscles, but more often is general, even extending to and involving the heart muscle. The usual changes of myositis are at first present, and, after these subside, ossification or calcification remains, the affected muscles being hard and bony. The process may be only partial, or it may be complete, the entire muscles being ossified, and even the joints and vertebræ may become fixed.

Etiology. — The causes are unknown. The disease is more common in males, and usually begins about puberty. It occupies many years in development.

Treatment. — So far as known, the disease has never responded to any form of treatment.

PROGRESSIVE MUSCULAR DYSTROPHY.

Definition. — A disease characterized by paresis and atrophy of the muscles, the latter being obscured by an interstitial fatty overgrowth, giving firmness and an apparent increase in size.

Varieties. — Four clinical forms have been described: (1) Pseudo-hypertrophic muscular paralysis; (2) hypertrophic paralysis; (3) primary atrophy; (4) progressive neural muscular atrophy.

Other forms of muscular atrophy, not of a progressive character, may occur from various causes, but which do not demand separate consideration. Most prominent of these is that known as *arthritic muscular atrophy*, which follows an inflammation of a joint, the muscles moving that joint being involved, though the condition is not considered as being due to an extension of the inflammation or to lack of use, but rather to reflex influences. Muscular atrophies may also result from direct injury, fracture of the bones, or prolonged work with a single group of muscles.

Pathology. — The definition given above refers more directly to the pseudo-hypertrophic form, in which the increase in interstitial connective tissue and of fatty tissue gives the muscle the appearance of enlargement. In none of the varieties named is there any lesion of the nervous system to be found, the whole process depending upon primary changes in the muscles. As the disease progresses, degeneration of the muscular fibers takes place, followed by atrophy, the muscles finally resembling masses of adipose tissue. In the hypertrophic form no atrophy is present until late in the disease, the condition being at first a true hypertrophy. In the primary atrophic form there may be at first some hypertrophy, but atrophy is the essential feature. Primary atrophy includes (a) Erb's form of *juvenile hereditary progressive muscular atrophy* or scapulo-humeral type, in which the affection first appears between the fifteenth and twentieth years of age, and involves the muscles of the shoulder, upper arm, gluteal region and thigh. It also includes (b) the *infantile type* or facio-scapulo-humeral type (*dystrophia musculorum progressiva*), as described by Landauzy and De Jerine. In the latter form the face and the shoulder girdle are affected. It is also a hereditary disease. In *progressive neural muscular atrophy*, or the peroneal type, which is also hereditary, the disease begins in the peroneal muscles, involving also the intrinsic muscles of the foot, and may lead to club foot of the variety known as pes-equinus or pes-equino varus. In after years the upper extremities may become affected. Different from the preceding forms mentioned, there are present fibrillary contraction, and, occasionally, the reaction of degeneration, and vasomotor and sensory disturbances are sometimes manifest. There is also in this variety a chronic interstitial neuritis with proliferation of the connective tissue, and destruction of the myelin sheaths and axis cylinders; and, sometimes, according to Goll, degeneration of the columns of the spinal cord. The process is probably due to a primary neuritis.

Etiology. — The various forms of this disease are all peculiar to childhood. Heredity is a most important causal factor, but is not

invariable in most varieties. In the *pseudo-hypertrophic form*, males are most subject to the disease, though it appears to be transmitted by the mother rather than the father, even though she herself be not diseased. Sometimes the family is affected through several generations. Long-continued consanguinity is considered a predisposing cause. It is sometimes associated with feeble-mindedness, hysteria, epilepsy and other disorders of the nervous system. It usually begins before puberty, but may develop as late as the twentieth year or later, which is more common in females. *Erb's form of juvenile hereditary atrophy* may occur in families where others have the pseudo-hypertrophic form. It is most common between the ages of fifteen and twenty. The *infantile* type is more distinctly hereditary than other varieties, and is found chiefly between the third and fourth years of age. In the *peroneal* type heredity is an important factor. It occurs between the ages of ten and twenty, and chiefly affects males. Aside from heredity, the causes are practically unknown.

Symptoms.—(1) *Pseudo-hypertrophic Form.*—The first symptoms are those of paresis. The child appears clumsy, and is especially awkward in jumping and in mounting stairs. The gait is waddling and uncertain. On rising from the floor, the patient first lifts his knees and then places his hands on his knees, and “climbs up his legs,” until he reaches an upright position. An examination reveals that the muscles of the calves of the legs are enlarged. Various other muscles may become involved, more especially the *infraspinatus*, the biceps and the triceps, thus giving the patient the appearance of an unequally developed athlete. In walking, the shoulders are thrown back, the abdomen forward, the vertebral column being arched forward in the lumbar region, the buttocks stand out, and the legs project far apart. Late in the disease the muscles become atrophied, and the paresis may extend to the upper extremities, so that the patient can no longer rise or walk, and, finally, all power in the affected limbs is lost, a cachetic state develops, and death follows,—the latter often resulting from some intercurrent disease. The knee reflex is usually present until late in the disease, there is no reaction of degeneration, and electric reaction is only diminished in proportion to the destruction of muscular tissue. In some cases the intellect is impaired. Epilepsy has also been noted. In very rare cases the symptoms are all modified, pursuing a milder course, and not ending fatally, the patient suffering only a weakness of the affected parts, which is not serious, but lasts through life.

(2) *Hypertrophic Form.*—The symptoms are practically the same as in the preceding variety, but there is at first a true muscular hypertrophy with atrophy following later in the disease,

(3) *Primary Atrophy.*—(a) *Erb's Form of Juvenile Hereditary Progressive Muscular Atrophy.*—The muscles of the shoulders and arms are first affected, rarely are the back and legs first involved; when so, it is the muscles of the gluteal region and thigh that have become atrophied. Owing to paralysis of the serratus, there is a marked projection of the scapulae giving the “winged” appearance so characteristic of the disease. Atrophy is the essential feature, and as this progresses, there is a corresponding loss of power and diminution of the reflexes and of the electrical reaction. The gait and symptom of “climbing the leg,” etc., are precisely the same as in the pseudo-hypertrophic variety. Atrophic changes in the diaphragm are possible, resulting in dyspnea, which sometimes proves fatal.

(b) *Infantile Type.*—The muscles of the face are chiefly involved, the eyes can not be completely closed, and talking, laughing and whistling are difficult. A characteristic and even diagnostic sign is the *facies myopathique*—a lifeless, expressionless face, due to the wasting of the facial muscles. The muscles of the shoulder are next to be involved, and are affected similarly as in the juvenile form of Erb. The muscles of mastication, the internal ocular, and those of the forearm and hand remain normal. There are no fibrillary contractions, no reaction of degeneration and a diminishing of electric reaction.

(4) *Progressive neural muscular atrophy.*—The peroneal type begins in the muscles of the foot, the common extensors of the toes, or the small muscles of the foot, or the muscles of the thenar or hypothenar eminences and the interossei. The deformity of club foot often results. When the muscles of the hand next become involved, there is a characteristic flattening of the ball of the thumb and middle finger, the interosseal grooves become deeper, producing the “claw-hand.” In this form fibrillary contractions are present, sometimes giving rise to an irregular tremor of the fingers. The reaction of degeneration and electric reaction may be present. Sensory disturbances are more or less present. Probably this disease is not correctly classed with the *myopathies*, but is of neurotic origin, resulting from neuritis. The nutrition and general condition of the patient remain in a comparatively normal state.

Diagnosis.—The diagnosis of one variety of dystrophy from another can only be made from the order of invasion and the muscles involved. Often two or more types are present in the same family, and, excepting the neural type, they are probably all modifications of one variety. The neural type shows more distinct evidences of neurotic origin as already noted.

Prognosis. — The course in all dystrophies is tedious and unfavorable, as far as a cure is concerned, though life may be greatly prolonged by proper treatment.

Treatment. — The course of dystrophies may be in many instances, at least, retarded by systematic gymnastics, mild massage and electricity. Moderate exercise should be kept up persistently, a hygienic mode of living adopted, and effort made to sustain nutrition and perfect the general health. Medication has accomplished very little. Old-school authorities rarely make any suggestions in therapeutics. Bartlett, in Goodno's "Practice of Medicine," recommends Potassium iodide and the preparations of gold on "account of their well-known influences over fatty degenerations and connective tissue overgrowths." He says the former may be given in from fifteen- to thirty-grain doses daily, which, he says, should be kept up for months or years. He also suggests Phosphorus, which is certainly as near homœopathic to the disease as any other remedy, and deserves consideration.

THOMSEN'S DISEASE.

Synonym. — Myotomia Congenita.

Definition. — A hereditary disease of the muscles, characterized by tonic spasms in muscles that have been voluntarily moved, relaxation taking place gradually.

Pathology. — The muscle is plainly enlarged, and histologically there is found an increase in the volume of the muscular fasciculi, and an increase in the number of nuclei. The connective tissue remains normal. The heart is not involved, but the diaphragm may be affected. The spinal cord is not diseased.

Etiology. — The disease is rare in this country. It is always hereditary and appears in early childhood. It occurs in family groups, sometimes through several generations. It is more frequent in males than females. Whether it is a primary disease of the muscles or due to a congenital defect in their innervation is not yet established. It is claimed that exposure to cold, severe bodily labor and emotional causes may produce the disease in those of myotomic antecedents.

Symptoms. — The chief symptom is the myotomic contraction. There is first noticed what appears to be a stiffness and rebelliousness of the muscles, especially of the extremities. Whenever after a rest a voluntary motion is attempted, the muscle remains in a state of painless, tonic contraction, relaxation taking place slowly. Each time the attempt is repeated, the contraction occurs less strongly, until it finally disappears, and the patient can continue to move the muscle without

further trouble. While it is ordinarily the muscles of the arms and legs that are affected, yet all muscles of the body may be implicated save the muscles of the face, eyes and larynx, and those of deglutition which usually escape. The spasms are encouraged by excitement, exposure to cold, and by fatigue, and are ameliorated by moderate exercise, the application of heat, and by neutral tranquillity. The muscles are well developed, even to excess, and are sometimes of great proportionate strength, but more often there is evident loss of muscular power. The electrical and mechanical excitability of the muscles is increased, the reflexes are usually normal, and the sensation remains unimpaired. There is sometimes mental depression, though this may be due to dwelling on the affliction.

Diagnosis.— Usually the diagnosis is easily established from the peculiar muscle contractions, which are not found elsewhere. Erb described a diagnostic electric reaction, called the myotomic reaction, which, if present, renders the diagnosis practically certain. Briefly described, it consists in a slowness of muscular contraction and relaxation under electric stimulation, and the passing of wave-like contractions from the cathode to the anode.

Prognosis.— The disease is incurable, but does not shorten life unless death results from injury, to which the sufferer is peculiarly liable.

Treatment.— There is no cure, but systematic, gentle exercise, together with a hygienic mode of life, may diminish the severity of the disease, and even temporarily arrest its course.

SECTION IX.

DRUG HABITS AND INTOXICATIONS, PTOMAIN POISONING, OBESITY, HEAT-STROKE.

ALCOHOLISM.

Definition.— The morbid results upon the human system of the excessive or prolonged use of alcoholic liquors. Alcoholism may be either acute or chronic. By acute alcoholism is usually understood the ordinary inebriety or habitual drunkenness. *Mania-a-potu* is an acute mania which may occur from the use of alcohol in persons of a highly nervous organization. *Delirium tremens* is a condition characterized by constant tremor, great exhaustion and distressing illusions and hallucinations, resulting either from the prolonged continuous action of alcohol on the brain, or from the sudden withdrawal of alcohol from an inebriate. *Dipsomania* is an uncontrollable desire for alcohol or “drink-impulse,” which may occur periodically in habitual drinkers.

ACUTE ALCOHOLISM.

This is the condition known as inebriety or habitual drunkenness. It may, or may not, include *mania-a-potu*, delirium tremens, alcoholic melancholia and even alcoholic paralysis. The two latter with alcoholic dementia are usually only the result of chronic alcoholism. *Mania-a-potu* is most apt to occur in those who have drunk very hard for a short time, as in a single night's carousal, a violent, and even homicidal, mania developing. This form should not be, as it often is, confounded with delirium tremens, the latter having different manifestations, and occurring only in chronic alcoholics, and will be considered under the head of chronic alcoholism.

Acute alcoholism is a drug habit—a vice, but not essentially a disease. Nevertheless, it may, and often does, lead to disease, and establishes pathological changes which are directly and only due to alcohol. Again, while acute alcoholism is a vice, it may be impossible to say that the morbid cravings which lead to the indulgence, are not due to repeated previous willful indulgences in drink, but to hereditary influences, making these cravings essentially a diseased condition. It must also be remembered that varying amounts of alcohol are required to produce drunkenness in different persons, some being very much more susceptible to its influences than others.

Symptoms.—It would appear that the symptoms of intoxication are so familiar that their description would be unnecessary, yet they often differ in different persons. Usually the primary effect of alcohol is that of excitement, with flushed face, injected conjunctivæ and loquaciousness. Then follows muscular incoördination,—the staggering gait,—and with it, incoherent speech, and later more or less complete narcosis. The breathing is deep and sometimes stertorous, the pupils dilated, the temperature subnormal. Involuntary evacuations of the bladder and bowels are not unusual. In some the primary effects are manifested by great violence, even to mania, and, on slight provocation, to a homicidal extent. In others the stage of excitement does not occur, the victim being only dull and morose and gradually passing off into a stupor. The stage of incoördination and stupor never fails to occur if a sufficient amount of alcohol is imbibed. This is a result of the effects upon the cortical nerve cells of the brain. In some instances death results from paralysis of the respiratory centers. In some cases the narcotic influences are less marked, the direct irritant action of the drug predominating and producing gastritis, and, less often, nephritis.

Most cases of acute alcoholism do not go beyond a stage of moderate excitement followed by mild narcosis.

Diagnosis.—The diagnosis of alcoholic intoxication is usually easy, yet mistakes are by no means infrequent, resulting in injustice and often unnecessary danger to the victim. Apoplexy, head injuries and uremia may be mistaken for drunkenness. In some instances, the apoplexy is directly due to alcoholism, thus making the diagnosis more difficult. In drunkenness the stupor is not usually so profound but that the patient may be aroused temporarily, either by shouting in the ear, applying ammonia to the nostrils, or by pressing firmly on a sensitive spot, as the supraorbital notch. In the article on Uremia will be found a table giving the chief diagnostic points between acute alcoholism, cerebral hemorrhage and uremia. In all cases of doubt

the subject should always be treated as if he were sick, rather than drunk. In most cases of acute alcoholism no treatment is required. For exceptional cases requiring treatment, the suggestions for the treatment of chronic alcoholism in its various manifestations will be sufficient.

CHRONIC ALCOHOLISM.

Chronic alcoholism is a disease manifesting itself in various forms and degrees, and invariably occurring sooner or later in all inveterate drinkers, though it must be borne in mind that, while a comparatively small daily consumption of alcohol may produce disease in one individual, much larger amounts may be tolerated with apparent immunity by another. I have in mind now two cases of habitual drunkenness which have been familiar to me, and more or less under my personal observation for nearly half a century. From my earliest recollections they have both been "gutter drunkards" of the worst type. They are now very old men and are both enjoying, apparently, better health than most men of their age, though less addicted to the liquor habit than in their early years. These are exceptional cases wherein the system has apparently become inured to the poison—"pickled," so to speak. It would appear that some possess a predisposition to become easily diseased from alcohol. Those who drink regularly every day for years, — even the "moderate drinker" — is more liable to suffer from chronic alcoholism than one who has periodical sprees, and who, during the intervals, abstains from drink, thus allowing the alcohol and its influences to be eradicated from the system. The children of alcoholics are more predisposed to the degenerative changes of alcoholism, and are more susceptible to various other organic diseases, especially of the nervous system, regardless of their own habits as to liquor drinking.

Pathology.—According to Payne, the poisons of alcohol are manifested (1) as a functional poison, as in acute narcosis; (2) as a tissue poison, in which its effects are seen on the parenchymatous elements, particularly epithelium and nerve, producing a slow degeneration, and on the blood vessels, causing thickening, and, ultimately, fibroid changes; and (3) as a checker of tissue oxidation, since the alcohol is consumed instead of the fat. This leads to fatty changes and sometimes to a condition of general steatosis.

Recent investigations prove that alcohol destroys cellular protoplasm, and the most complicated cells, as far as function is concerned, are the most vulnerable. All recent investigations show quite conclusively that the destructive effect of alcohol is largely centered upon

the elementary histological units, and thus is readily explained its most disastrous effects upon the human system.

The nervous and digestive systems and the kidneys suffer most frequently and most profoundly from alcohol poisoning. Malt liquors are most liable to produce fatty changes, gastric catarrh and dilatation of the stomach. They may produce cirrhosis of the liver. They may also cause congestion of the kidneys and hypertrophy and fatty changes of these organs. The small, sclerosed and fibrous kidney, as occurring in chronic interstitial nephritis, is found in drinkers of spirituous liquors, but is not of so frequent occurrence as once supposed. Atheromatous changes in the blood vessels are mostly found in spirit drinkers, but this, as well as fatty degeneration of the heart, may be caused by malt liquors. Anders says that "sudden death has been caused in inebriates by the rupture of small aneurysms of the middle cerebral artery." Various sclerotic changes may occur in the brain, while the nerve cells and nerve tissues show degeneration, hardening and atrophy. Nerve changes are chiefly found in spirit drinkers, in whom alcoholic neuritis is not infrequent.

Symptoms.—As may be inferred, the symptoms vary greatly, depending in their character upon the nature of the organic changes which are occurring. As a rule, impairment of digestion is first noted. These are usually indicative of gastric catarrh—coated tongue, foul breath, vomiting before breakfast, gastric distress and constipation or diarrhea, the two latter often alternating. Next in order are usually noted the symptoms of impaired nervous function, followed after a time by those indicative of organic nerve changes. First of all are seen an unsteadiness and tremor, especially of the hands, then of the tongue, and later of the lower extremities. The intellect becomes sluggish, and the moral senses blunted; the patient becomes morose, irritable, restless and sleepless. Kerr says: "Alcohol dims the perception, confuses the judgment, paralyzes the will and deadens the conscience." These symptoms may go on to dementia and insanity or paresis. Gradually there develop the symptoms characteristic of one or more of the various lesions that have already been mentioned, a description of which may be found under their respective heads elsewhere in this book.

Delirium tremens is a form of delirium occurring only in chronic habitual drinkers. It usually follows a debauch, and almost invariably occurs only in those who drink spirituous liquors. It rarely occurs in those who go on occasional sprees, but who are temperate during the intervals. It may occur when, from any cause, the usual supply of alcohol is withdrawn. This may be necessary on account of an attack

of acute illness, more especially of pneumonia, to which alcoholics are especially predisposed. It is claimed that pneumonia in itself is an exciting cause of delirium tremens. Strong arguments are adduced to prove that delirium tremens never results directly from the withdrawal of alcohol, but from other associated causes.

Usually an attack is preceded by anorexia, sleeplessness, despondency and extreme restlessness, soon succeeded by tremors. He tries to get out of bed or out of the house to do imaginary things, talks incoherently, and looks and acts uneasy and fearful. This is soon succeeded by hallucinations of vision. He sees terrifying monsters, serpents, rats, mice and other vermin, and tries to escape from them, or throw them away from him. Hallucinations of hearing and taste may also be present. He exhibits an expression of extreme terror. The term "horrors" aptly expresses the condition, which may become so great as to make the patient violent and unmanageable and requiring restraint, and suicide is not unusual. There is great muscular weakness, the tremors increase, there is moderate fever, and a frequent, feeble and often irregular pulse. The delirium usually subsides on the third or fourth day; but, in unfavorable cases, it may not, gradually giving place to a muttering delirium; the exhaustion increases, the tongue becomes dry, brown and cracked, and a general typhoid condition sets in, death resulting from heart failure, or coma or convulsions close the scene. In some instances, cerebral hemorrhage or pneumonia complicate the case, and bring about an unfavorable termination.

Diagnosis.—The diagnosis of chronic alcoholism is, from the history of the case, never difficult; but to establish exactly the character of the existing lesions is often not an easy matter. If the habits of the patient have been concealed, there may be danger of confounding the disease with nervous dyspepsia or some nervous disease, such as paralysis agitans, locomotor ataxia or epilepsy.

Delirium tremens is usually easily recognized from the history and peculiar symptoms of the case. It must be differentiated from *mania-a-potu* by the fact that the latter is usually the result of acute alcoholism, and is characterized by a furious mania, great muscular contractions and convulsive movements. From the standpoint of treatment, however, the differentiation is non-essential.

Prognosis.—The prognosis of chronic alcoholism depends upon the nature and extent of the consequent lesions. If the tissue changes are profound, they are never cured, but may be relieved, and life greatly prolonged. Many complications are liable to supervene and produce a fatal termination, notably pneumonia and Bright's disease. Delirium

tremens, when uncomplicated, usually ends in recovery. The cure of the alcohol habit is, on account of the large percentage of relapses which take place, a mooted question. Great success is invariably claimed by those who treat these cases in private institutions and by means of secret remedies.

Treatment. — In the first place, alcohol should be absolutely withdrawn. This is a difficult matter to accomplish outside of institutions. If there is alcohol or undigested food in the stomach, and especially where profound coma or other alarming symptoms are present, the stomach should be washed out, using hot water with a little ginger or cinnamon. Emesis may be necessary, and, if so, warm water and mustard are usually all that are required. If the patient can not swallow, hypodermic injections of ipecac or apomorphia may be employed.

In *mania-a-potu* and *delirium tremens* the patient must be carefully watched and soothed as far as possible by hydrotherapeutic measures and the use of the indicated remedy, which is usually either *Hyoscyamus* (3x), *Belladonna* (3x) or *Stramonium* (2x). Morphine, the bromides and chloral should never be employed, more especially the first named. The bromides and chloral only act when given in large and dangerous doses. The hydrobromate of hyoscine, $\frac{1}{100}$ of a grain every four or six hours, may often be employed with great success. If stimulation be required and the patient can swallow, it is best to use aromatic spirits of ammonia, twenty or thirty drops in a little water, or administer a cup of strong black coffee. If swallowing is impossible, it may be necessary to resort to hypodermic injections of strychnia.

Easily digested, nutritious foods should be given. Often the prepared peptonized foods, such as panopepton or trophinine, answer an excellent purpose, especially where the stomach will not retain ordinary food. For the treatment of the various organic lesions and their symptoms, the reader is referred to these diseases as elsewhere considered. The treatment of the liquor habit can only be successfully accomplished when conducted in an inebriate hospital, where the habits and life of the patient are under constant observation and absolute control. For this reason the details of such treatment need not be discussed in this connection. Many secret remedies ("gold-cures") have sprung up within the past few years and for which great merits are claimed. As near as I can learn, *Nux vomica* and *Cinchona* are the chief remedies entering into their composition. The value of both of these remedies, more especially the former, in such conditions has long been known and acted upon by homœopathic physicians and even by many intelligent laymen.

Therapeutics.—**Nux vomica** (3x).—This is the remedy above all others in value in the average case of alcoholism. Many an alcoholic constantly carries *Nux vomica* in his pocket, not only to overcome the remote gastric disturbances that may trouble him, but also to ward off or mitigate the consequences of a debauch. A few doses of *Nux* will often aid greatly in sobering up an ordinary drunk. Its symptoms correspond, not only to the morning headache, the coated tongue, and the disordered stomach of a drunkard, but they also cover many of the nervous symptoms—the tremors as well as the mental symptoms of one on the verge of, if not actually in, delirium tremens. Altogether, it is a most remarkable antialcoholic remedy, and may be useful in all stages and all conditions of alcoholism.

Hyoscyamus (3x).—This is the chief remedy in delirium tremens, and is often required in *mania-a-potu*; though more often in the latter and occasionally in the former, the more maniacal *Stramonium* is better indicated. Under *Hyoscyamus* there is great nervous excitement and restlessness, constant muttering delirium, unintelligible chattering or talking, imaginary fears, constant meddling with the hands and tremulousness. Constant insomnia is an important indication. There is no apparent heat, the face is pale and the limbs are cold, though the temperature is above normal. The pulse is small, quick and compressible. In some cases clonic spasms are present. In such cases I prefer the 2x or 3x dilution. Many prefer the tincture in water. If *Hyoscyamus* seems to be indicated but does no good, which, in my experience, very rarely occurs, and especially if there is great insomnia, the hydrobromate of hyoscyne used hypodermatically acts well, calming the nervous excitement and producing sleep.

Stramonium (2x).—This drug is useful when there is a violent mania, the chief element being one of terror and desire to escape, terrifying hallucinations, especially of horrible animals coming at him from every corner. The face is bright red, but the characteristic congestive symptoms of *Belladonna* are absent. The *Stramonium* patient wants plenty of company in the room to help protect him, and plenty of light—the opposite of *Hyoscyamus* which is averse to light and company.

Belladonna (3x).—This drug has the mental symptoms of delirium tremens, but is rarely useful because its congestive symptoms are almost never present, the tendency being to an asthenic state in which *Belladonna* cannot be well indicated. If, however, there be a flushed face, throbbing carotids and bounding pulse, no other remedy will answer.

Opium (3x).—This is an invaluable remedy in delirium tremens, especially in old and oft-repeated cases—“old sinners.” Delirium with wide open, staring eyes, expressing great terror; sees frightful

animals springing up everywhere. In other cases, the patient is dull and stupid and has stertorous breathing. Especially useful in cases simulating apoplexy.

Sulphuric acid. — This is one of our great remedies in chronic alcoholism, especially in old cases and where gastric and hepatic symptoms predominate. The stomach feels cold and weak, and the patient craves stimulants. Given crude, a few drops in a glass of water, Sulph. acid will remove the immediate craving for liquor. It is useful much later in the disease than *Nux vomica*, and suits the persistent acid dyspepsia, sour breath and vomiting of old drunkards, especially when the circulation is at a low ebb, the patient appearing and feeling shriveled and cold. Tincture in water should be employed.

Ranunculus bulb. — This drug has been found useful in delirium tremens and for the effects of intoxicating liquors in general. Most useful in acute alcoholism. The tincture in water is the best preparation.

Capsicum is indicated in much the same class of cases as Sulph. acid. Given in ten-drop doses in water, it has much the same effect as the latter, warming up the chilled stomach, improving the circulation, relieving the craving for liquor, and removing the nausea and vomiting. It is also said to control the nervous restlessness and tremor, and induce sleep.

Consult also: *Arsen.* (3x), *Cannab. ind.* (1x), *Cimicifuga* (1x), *Lachesis* (6.) and *Tartar emetic* (3x).

MORPHINISM.

Synonyms. — Opium Inebriety, The Morphine Habit, Morphomania.

Definition. — A chronic intoxication, due to the excessive and habitual use of Morphine, or opium in some other form.

Pathology. — There are no distinctive pathological changes. Such as are found are due to malnutrition — tissue starvation — and contrast with the sclerotic and cirrhotic changes and the degenerations of alcoholism.

Etiology. — While the opium habit in a comparatively small number of cases in this country is purposely acquired for sensuous reasons only, the large majority of cases find their origin in the use of the drug to relieve pain or produce sleep. "The incautious prescribing of Morphine and the too-ready hypodermic use of the alkaloid by physicians in treating various cases of pain are not infrequently the cause of morphinism." (Anders.) Neurotic persons, and especially women, are

more commonly the victims of morphinism, though physicians and, to a less extent, druggists are most likely, as a class, to succumb to the seductive influences of the drug. The reasons are apparent. Women suffer more from periodical attacks of pain (neuralgia, dysmenorrhea, etc.) than do men, and, as opium offers the only certain relief, they resort to it until the habit is formed. Physicians suffering from overwork, anxiety, irregular hours and loss of sleep, to say nothing of attacks of pain, find in morphine a ready-to-hand relief and solace, upon which they too easily learn to depend. Insomnia is a most distressing ailment, and both rich and poor, learned and unlearned, are ready to resort, temporarily, as they think, to any drug that offers a certainty of producing the much-desired sleep. Once used, they have not the courage to face a sure return of their insomnia, and thus the drug is continued until its use becomes a fixed habit. The desire for the drug after a time becomes a craving, and is only satisfied by repeated and gradually increasing doses, until more or less enormous quantities are taken daily, the system becoming gradually accustomed to and tolerating its presence without poisonous effects.

Symptoms. — At first, and until the constantly increasing craving for the drug has led to its use in comparatively large amounts, varying greatly in different individuals, there are no particular symptoms manifest. Lassitude and mental depression, usually accompanied by some gastric disturbance, are first noticed after the effects of a dose have worn off, and which lead the victim to resort to another dose for their amelioration. Gradually there develops the opium cachexia — emaciation, anemia, a sallow, grayish complexion and a prematurely aged appearance. There is a steadily increasing weakness and languor, gastric disturbances, anorexia, restlessness, mental depression, irritability, a dread of impending evil, insomnia and tremors. The patient becomes irresolute, has no will power, loses self-control and, sooner or later, reaches a stage of moral obliquity, wherein untruthfulness is a marked feature. Itching is a common symptom, and various neuralgic pains, especially cardialgia, are frequently present. Diarrhea is not infrequent. After the habit has been prolonged, tremors and other nervous symptoms are prominent, even paresis or, more rarely, ataxia. In women there are often pronounced hysterical symptoms, while in men there is neurasthenia. As time passes, asthenia becomes pronounced, and the patient may die from exhaustion or from some intercurrent disease to which he is especially liable. As a rule, males are sexually impotent, and amenorrhea and abortion are common in females.

Diagnosis. — The diagnosis is usually readily made from the history of the case, the symptoms showing a marked contrast to those of alcoholic intoxication.

Prognosis. — There is little hope of curing a morphine fiend outside of an institution where he may be under constant surveillance, and even then the cures are not so frequent as those in charge of such institutions usually claim. Often the habit is suspended for a length of time under the treatment, the health greatly improved, and life prolonged.

Treatment. — The essential elements in treatment are : Isolation, rest, diversion of mind, systematic feeding and a gradual withdrawing of the drug. The latter should not be too gradual. Erlenmeyer recommends the "rapid-gradual" method, in which the drug is entirely shut off within a week or ten days. In no case should cocaine be substituted for morphine. Its effects are far more to be dreaded than are those of the latter. The diet should consist of milk, cream, beef juice, beef peptonoids or peptonized foods, such as panopepton, trophonine or bovinine. Hot and cold bathing and the use of galvanism are important aids in treatment. For the symptoms which arise in consequence of the withdrawal of the drug, appropriate remedies must be employed. If stimulants are required, alcohol may be given in small doses. If heart failure threatens, a hypodermic injection of strychnia may be required. For the sleeplessness, Hyoscyamus (3x), or, in unyielding cases, the hydrobromate of hyoscyne hypodermatically. Often Sulphonal acts well in these cases. I know of one specialist who uses only Chloral combined with Cannabis indica. For the diarrhea, Cinchona tincture usually acts well. Other remedies often required for various symptoms are Anacardium (3x), Belladonna (3x), Coffea (3x), Nux vomica (3x) and Zinc (6x), especially Zinc valerianate (1x).

COCAINISM.

Synonym. — The Cocaine Habit.

Definition. — A chronic intoxication brought about by the excessive and habitual use of cocaine.

Etiology. — Cocainism is a modern habit, the existence of which has, until quite recently, been seriously questioned. Unfortunately, there is now an abundance of evidence that such a habit does exist, and that its results are more dangerous and frightful in their character than are those of either alcoholism or morphinism. It has not been demonstrated that the chewing of the coca leaves, as indulged in by the natives of South America, has any noticeably harmful effects, but since the alkaloid cocaine came into general use as a local anesthetic, and has been extensively used in nose and throat inflammations, and has entered into the composition of many of the nostrums advertised for the cure of catarrh, there has been an alarming increase of those conditions

which we now know to be due to the habitual use of cocaine. The soothing influences of cocaine upon an irritated or inflamed mucous surface are so prompt and seductive in character that a patient once having used it, readily resorts to it again and again, until, after a comparatively short time, he is not able to do without it. It is in this way that in a very large majority of cases the habit is acquired. Next in etiological importance is the method of attempting to cure morphinism by substituting cocaine. It is a very successful method, so far as the original intent is concerned, but the ultimate results are far more disastrous than if the patient had been left to his previous indulgences. The habit is comparatively frequent among physicians. In some it is acquired by using the drug for cerebral stimulation; in others it is acquired by specialists through its tentative local application to their own mucous membranes while treating patients. Tyson has seen three such cases in three successive chiefs of clinic in throat and nose dispensary service.

Symptoms.—The first effects are those of a stimulant, and afterward those of a narcotic. The action on the nerve centers resembles that of caffeine, and the action on the respiratory and circulatory organs resembles that of atropin. The first symptoms resemble the primary effects of alcohol. The heart's action is rapid, the pulse showing weakness on slight effort; the respiration is increased in frequency, and dyspnea is readily excited by exercise; the eyes are bright and the pupils dilated; there is great loquacity; hallucinations and illusions resembling those of alcoholism; the skin of the body is dry and harsh, and the extremities are covered with a cold, clammy sweat; the appetite is greatly impaired; the patient becomes emaciated; there is great restlessness and insomnia. The moral and mental powers show a gradual decay. The patient is suspicious of everybody, even of his own family and friends, his eyes giving expression to a suspicious, haunted look. Tinnitus aurium is not infrequent. Mild epileptiform spasms may occur with partial loss of consciousness. Spasms of single groups of muscles may be present. Nystagmus is not unusual. Tactile hallucinations are said to be characteristic of cocaineism. The victim imagines he feels an insect or some foreign body under the skin, and will work diligently for its removal. The circulation may become more and more feeble, and the patient die from exhaustion or heart failure. Or, instead, as is more often the case, the symptoms of cerebral weakness grow more marked, and the patient becomes insane, requiring restraint. The whole case presents a horrible picture of entire loss of intellect and moral sense, the patient sinking to a degree of degradation far surpassing that of alcoholism.

Prognosis. — Fortunately, good results may be anticipated if the drug is withdrawn and proper treatment is established. Relapses are not so common as in morphinism, and if taken in time, the evil effects of the drug are more readily eliminated. Cases complicated with morphinism or alcoholism are very unpromising.

Treatment. — The patient must be for a long time under strict surveillance. This can best be accomplished in an institution. The drug must be withdrawn at once and absolutely. No serious consequences usually follow such a course. The food should be nourishing and easily digested. Such stimulants as coffee, alcohol and aromatic spirits of ammonia should be given to overcome any depression that follows the removal of the drug. Strychnia or digitalis may be required as indicated. The further treatment is purely symptomatic.

PTOMAININE POISONING.

The term "ptomaines" is given to a large number of substances which are generated in the decomposition of albuminous matter as the result of bacterial action. They differ greatly in their character, some being very poisonous, while others are entirely harmless. The former have been termed toxins, though the term "ptomaines" is usually employed. They only occur in consequence of putrefactive changes either in dead animal tissue or secretions or products. Their presence and effects must not be confounded with the presence or effects of saprophytic germs, which sometimes contaminate food and produce poisonous symptoms. The possibility must be borne in mind, however, that saprophytic bacteria may be taken into the system with food thus infected, and, under some conditions, live in the body as parasites, especially on dead matter, and there become toxicogenic. In some cases cooking destroys the ptomaines; in others it does not. Some are present in one stage of the putrefactive process, others in another; but they are mostly manifest in the early stages, even before the senses can detect any change. They present great similarities to the vegetable alkaloids, and ptomaine poisoning is often wrongly inferred to be due to the presence of some vegetable alkaloid, such as morphia or cocaine. There are methods by which the difference can be detected, except in the case of muscarin, which seems so nearly identical with the alkaloid of *Agaricus muscarius* that no means of differentiation has yet been established.

The most common forms of ptomaine poisoning are: (1) Meat poisoning; (2) poisoning by milk and its products; (3) poisoning by fish and shellfish.

(1) *Meat Poisoning*.—This may occur from the ingesting of various tainted meats, beef, veal, mutton, poultry, sausage and ham. Mince-meats and chicken salad, not properly preserved, are common sources of infection. The same is true of all kinds of canned meats, that are opened and allowed to stand a length of time before being eaten.

The **symptoms** are divided by Mann into two classes: (1) Those due to a true infection; (2) those due to simple poisoning. Cases of the former group present the symptoms and course of an infectious disease, and often simulate typhoid fever so closely that their real nature is not suspected. In the second class, there may or may not be a period of incubation, characterized by languor, malaise, rigors, loss of appetite, nausea, vertigo, fainting and abdominal pains. More often, after from one to forty-eight hours, the symptoms set in suddenly and with great intensity, and are such as characterize a violent attack of gastro-enteritis—nausea, vomiting, violent cramps and purging. The colicky pains are very severe; and are usually accompanied by cold sweat; the stools are dark and exceedingly offensive. There are profound prostration and muscular weakness, and often severe cramps in the legs. The temperature rises, and the pulse is accelerated. In grave cases, the temperature drops to subnormal, choleraic symptoms become more marked, there is a collapse, and death may follow. From fifteen to fifty per cent of all cases terminate fatally.

(2) *Poisoning by Milk and Its Products*.—It has long been known that milk and its products—cheese, ice-cream, custards, etc.—sometimes possessed poisonous properties, but the nature of the poison was not understood until ptomaine poison explained it. Vaughan has isolated this special poison, and termed it tyrotoxicon (cheese poison). This is the toxin present in most cases, but not in all; or, at least, it has not been found in all. Probably some cases are not due to ptomaine poisoning, but to some metallic or other poison accidentally derived from some unknown source. This is especially true of ice-cream, where a poison might be obtained from the can and paddle, or from the flavoring extract. Ptomaine poisoning explains the frequency of gastro-intestinal troubles in bottle-fed babies during the summer months. The symptoms are those of an acute gastro-intestinal irritation.

(3) *Poisoning by Fish and Shellfish*.—There are certain species of fish that are supposed to be always poisonous, but it is altogether likely that their poisonous properties are derived from the food upon which they subsist. Mussels furnish the most frequent source of poisoning; but whether there is a special poisonous variety, or whether a

mussel becomes poisonous under certain circumstances, has yet to be definitely established. Poisoning may also occur from eating stale oysters, deviled crabs, lobsters and fish salads. The most frequent cause of poisoning is the use of the tainted preserved or canned specimens. The symptoms are variable. In some cases the symptoms of gastro-intestinal inflammation or choleraic symptoms predominate with some nervous disturbance. In others the nervous symptoms are markedly predominant, even to cerebrospinal manifestations. In the latter class of cases there may be a sensation of heat and itching and the development of erythema and urticaria, often accompanied by dyspnea.

In either class of cases the symptoms are usually intense, and the course may be rapid, collapse and death sometimes occurring within one or two hours.

Treatment of Ptomaine Poisoning.—The usual methods of eliminating poison by means of emetics and purgatives are not often required, as the emetic and purgative character of the poison itself usually obviates this necessity. Nevertheless, if there is reason to suppose that any residue of food still remains in the stomach or intestinal canal, mechanical measures for its speedy removal should be employed. Aside from this the treatment is purely symptomatic. Stimulants may be required in some cases. The therapeutic indications are essentially the same as in any gastrointestinal inflammation. *Arsenicum* (3x) is the remedy above all others in most cases of ptomaine poisoning; but *Bryonia* (3x), *Nux vomica* (3x), *Veratrum alb.* (2x), *Carbo veg.* (6x), *Carbolic acid* (2x) and other remedies should not be overlooked. Long before we knew anything of ptomaines, *Carbo veg.* was recommended for "ailments from eating putrid meat or fish, or rancid fats." It is, however, not adapted to cases of violent ptomaine poisoning in most instances, though it may be of service in the stage of collapse, and for subsequent disturbances during convalescence.

OBESITY.

Synonyms.—Polysarcia Adiposa, Lipomatosis Universalis, Corpulence.

Definition.—An excessive development of fat about the body, to the extent of causing inconvenience and impairing the bodily functions.

Etiology.—Heredity is the chief predisposing factor. It is well known that corpulency is quite liable to run in families. In these cases the fat is apt to develop in early life, but this is not always the case. In some it is not manifest until middle life, this being the age when

most non-hereditary cases begin. Climate is also a predisposing cause. The condition is much more common in hot, moist climates and in the lower countries of the temperate and arctic regions. Sedentary habits and occupations favor obesity, muscular inactivity contributing to fat accumulation. Women are more subject to corpulence than men, and, in both sexes, sexual continence favors the development of fat. Corpulence itself favors its further development, probably by interfering with normal muscular activity.

The only exciting cause, from a practical standpoint, is overeating and overdrinking. While a person, owing to heredity or predisposition, may become corpulent who eats very little, yet this is the exception. As a rule, corpulent persons are liberal consumers of not only food and drink, but especially of those classes of food and drink that tend to produce fatty tissue. The ingestion of carbohydrates and fats, in excess of bodily requirements, results in an abnormal accumulation of fat. To the former class belong the sugars and starches, as well as alcoholic beverages, especially beer, ale and porter, which, as is well known, promote fatty infiltration and degeneration, liberal beer drinkers furnishing a large quota of both fat men and women. In spite of these supposedly well-established facts, Osler says that "it is now generally conceded that the carbohydrates, which were so long blamed, are not at fault, since they are themselves converted into water and carbon-dioxide. On account, however, of the facility with which they are utilized for the purpose of oxidation, the albuminous elements of the food are less readily oxidized, not so fully decomposed, and the fat is, in reality, separated from them. So, too, the fats themselves are not so prone to cause obesity as the carbohydrates, being less readily oxidized and interfering less with the complete metabolism of the albuminous elements."

Oertel claims that a simple diminished ingestion of fluids, without other changes in the diet, will reduce the amount of fat.

Symptoms. — It is hardly necessary to enumerate the well-known symptoms, both objective and subjective, of obesity. Probably the most important symptom is breathlessness on exertion, and, later on, independent of exertion. This symptom is due to the accumulation of fat on internal viscera, causing a restriction of both heart and lung motion, thus causing imperfect aeration. Later this results in cardiac hypertrophy, and, still later, to fatty infiltration of the heart-walls and its usual consequences. The symptoms of fatty infiltration and degeneration of the internal viscera have already been considered under their appropriate headings.

Treatment. — Prophylactic measures should be early adopted in those who show signs of advancing corpulency. Fat-producing foods should only be allowed sparingly; and moderate, systematic outdoor exercise persevered in. In both diet and exercise, due care must be had as to the requirements of the individual, as regards both his occupation and the condition of his vital organs.

Dietetic treatment is of first importance. Various tables have been published, each varying from the others, according to the individual views of the author as to the food causes of the condition. Ebstein's treatment consists in reducing the quantity of food ingested. He absolutely forbids the carbohydrates, including sugar, sweets and potatoes, and limits bread to the smallest quantity possible. All kinds of meat and vegetables are allowed, especially the leguminous vegetables, with tea, coffee and light wines.

Banting's treatment excludes almost all fats, but permits a larger allowance of albuminous foods, and does not restrict water and vinous and spirituous liquors. There are certainly very few cases where the latter can be safely allowed. I think it better to prohibit alcoholic beverages in all cases.

Oertel allows more fat than Banting, but less fat and more carbohydrates than Ebstein, and greatly restricts the use of fluids. This diet, together with Oertel's rules for systematic bodily exercise, are especially useful in cases of corpulence with a weak heart.

Schweininger's treatment is practically the same as Oertel's, only that he forbids fluids with meals, and permits their use only after two hours have elapsed. According to Tyson, "A diet of skimmed milk only is a sure way of reducing fat, and a start may be made with it, commencing with two ounces every two hours and increasing until six or eight ounces are attained." Few patients would long endure this diet without the addition of some other form of food.

Mechanical Treatment. — This must be carried out in connection with a proper diet, if good results are to be obtained. It consists in systematic exercise, which must be of a character and graded to suit the individual case. Light labor, gymnastics, walking, mountain climbing or cycling are to be considered. In cases where there is great dyspnea and precordial distress on exercise, and especially when there is cardiac dilatation or fatty degeneration, Oertel advises a graduated exercise up inclines of various grades. The distance and the degree of inclination to be gradually increased.

Medicinal Treatment. — Notwithstanding the many vaunted cures by *Phytolacca*, I have never observed any permanently favorable results from its use. Anders says: "It may reduce the weight, but it usually

does so at the expense of bodily strength." I have seen wonderful results from the use of the thyroid extract, but, in other cases, the results have been absolutely negative. The use of thyroid extract is not unattended with danger. See article on Myxedema.

Many of the symptoms resulting from obesity, or associated therewith, may require the indicated homœopathic remedy. The following remedies are claimed to be useful for obesity, and may aid in the reduction of fat, if the dietetic and mechanical means are persevered in, provided the indications for their use are present: *Agaricus* (3x), *Antim. crud.* (6x), *Arsen.* (3x), *Baryta carb.* (6x), *Calc. carb.* (6x), *Graphites* (6x), *Lycop.* (6x), *Merc. sol.* (3x) and *Sulph.* (6x).

HEAT-STROKE.

Synonyms.—Sunstroke, Heat Exhaustion, Insolation, Thermic Fever, Coup de Soleil.

Definition.—A diseased condition induced by exposure to excessive heat.

Pathology and Etiology.—Two forms are recognized, heat exhaustion and heat-stroke, though they are usually included under the general term of heat-stroke or sunstroke, the former being more nearly correct, as either form may occur quite independently of the rays of the sun. The pathology of the two forms mentioned is explained by H. C. Wood. He says: "*Heat exhaustion*, with lowered temperature, represents a vasomotor palsy, i. e., a condition in which existence of the heat paralyzes the center in the medulla, and the heat is dissipated more rapidly than it is produced." This explanation may be only fully understood by reading Dr. Wood's explanation of the pathology of *heat-stroke*. He says: "There is in the pons, or higher portion of the nervous system, a center whose function is to inhibit the production of animal heat, and in the medulla, a center (probably the vasomotor center) which regulates the dissipation of bodily heat. Fever is due to a disturbance of these centers, so that more heat is produced than normal, and proportionately less thrown off. Let it be supposed that a man is placed in such atmosphere that he is unable to get rid of the heat which he is forming. The temperature of the body will slowly rise, and he may suffer from a general thermic fever. If early or late in this condition, the inhibitory heat centers become exhausted by the effort which it is making to control the formation of heat, or becomes paralyzed by the direct action of the excessive temperature already reached, then suddenly all tissues will begin to form heat with the utmost rapidity, the bodily temperature rises with a bound, and the man drops over with one of the forms of Coup de Soleil."

Van Gieson, after a study of a large number of cases, holds to the somewhat improbable theory that the immediate basis of heat-stroke is "a species of autointoxication," with heat only a contributing cause.

The *Morbid Anatomy* is thus described by Osler: "*Rigor mortis* occurs early. Putrefactive changes develop with great rapidity. The venous enlargement is extreme, particularly in the cerebrum. The left ventricle is contracted and the right chamber dilated. The blood is usually fluid; the lungs are intensely congested. Parenchymatous changes occur in the liver and kidneys." Van Gieson found in three cases an acute parenchymatous degeneration of the nerves of the whole neural axis. He also found the chromophilic plaques in the cortical cerebral and cerebellar cells, and also in the cells of the anterior horns of the spinal cord, diminished in number, changed in shape and position, sometimes finally broken up, and even entirely absent.

The *predisposing causes* of heat-stroke include all influences, habits and conditions that tend to lessen the bodily resistance to excessive heat. The most prominent of these is the alcohol habit. Drinkers of spirituous and malt liquors are especially liable to sunstroke. Over-eating, worry, excitement and unsanitary surroundings may also predispose to the disease. Previous sunstrokes predispose to future attacks.

The *exciting cause* of heat-stroke is exposure to excessive heat. This does not necessarily mean an exposure to the direct rays of the sun in hot weather. Such are a majority of cases, and they are properly termed *sunstroke*. Heat-stroke may result from an excessively high temperature within doors, especially when the rooms are close and confined, as in boiler rooms, stoke rooms, foundries, laundries, kitchens, etc. Whether the exposure be out of doors or within, if the atmosphere be heavily charged with moisture, as on a hot, humid or sultry day, or in a room charged with more or less escaping steam, heat-stroke will occur much more readily than if the atmosphere be dry.

Symptoms.—*Heat Exhaustion.*—In its mildest form, this may amount only to a sense of great weakness and faintness on slight exertion. This increases in severer cases until the prostration becomes profound, the faintness more pronounced, the face pallid; there is dizziness, at times blindness and cold sweat. In some cases, the victim faints away and remains unconscious, or partially so, until restored by stimulants. He may then pass into a sleep and awake practically well, but more liable to a return of the attack, if again exposed to similar conditions. In the most severe cases reaction does not take place from stimulation, there is profound collapse, the pulse becomes rapid and feeble, the temperature subnormal, and there is restlessness and muttering delirium.

Heat-stroke. — There are two varieties: (1) Asphyxial or apoplectic; and (2) hyperpyrexial.

(1) *Asphyxial.* — This variety, termed heat-apoplexy, is the least common. It is said to occur chiefly in soldiers and always under the direct rays of the sun. The victim may suddenly fall unconscious, and die within an hour or two with symptoms of cardiac failure and coma. In most cases, however, there are brief, sudden premonitions — dizziness, throbbing pain in the head, great oppression and sometimes nausea and vomiting. Unconsciousness may not be profound. The face is flushed, the carotids throbbing, the breathing labored and stertorous, the skin hot and dry, the pupils contracted, urination is frequent, and there is usually mild delirium. The temperature rarely rises above 102° F., and may be subnormal. In rare cases it may rise to from 104° to 106° F. The muscles are usually relaxed, but there may be twitchings and even mild convulsions. Visual disturbances are not unusual, and colored vision may be present. In some cases there is diarrhea. Wood speaks of a peculiar "mousy" odor exhaled by the entire body. In favorable cases the temperature gradually becomes normal, consciousness returns, the symptoms abate, and, for the most part, have disappeared in three or four days. In fatal cases the coma becomes profound, the pulse more rapid and feeble, the respiration more rapid, irregular and shallow, assuming the Cheyne-Stokes type previous to death.

(2) The *hyperpyrexial* variety is most common. It resembles the asphyxial type with the addition of an intensely high temperature (thermic fever), which sometimes before death rises as high as 115° F., or even higher. At any time the patient may suddenly become comatose and die from asphyxia. Some cases of heat-stroke make a complete recovery. Others show permanently a more or less weakness of the mental powers, and are incapacitated for any sustained mental labor, especially in hot weather. The most constant after-effect is an inability to endure high temperature, particularly exposure to the sun's rays, even though the latter be only moderately severe. They may become uneasy or excited, and have severe pains in the head and upper cervical region whenever the temperature reaches 80° or 90° F. Sometimes epileptiform convulsions occur, and chronic meningitis may result.

Diagnosis. — The diagnosis is usually readily made. The history of the case and the circumstances under which it has occurred, with the characteristic symptoms present, serve to differentiate heat-stroke from acute alcoholism, cerebral apoplexy, meningitis and uremia. The differentiation between heat-stroke and heat exhaustion is important

from a therapeutic standpoint, but is readily established by the presence or absence of thermic fever, as well as other conditions already noted.

Prognosis. — Most cases of heat exhaustion fully recover, except in that they may be more liable to future attacks. The prognosis of sunstroke depends entirely upon the severity of the stroke and the physical condition and habits of the patient. Cases occurring in alcoholics and beer drinkers furnish the most unfavorable prognosis.

Treatment. — *Prophylaxis.* — The proper prophylactic treatment of heat-stroke is obvious. The skin should be kept in good condition by bathing, the sleeping rooms should be well ventilated, the diet should be moderate, all stimulants, especially alcoholic, should be prohibited, and overheat, particularly exposure to the direct rays of the sun, avoided as far as possible. In hot weather it is important that everyone lead as regular and temperate a life as possible, avoiding excesses of all kinds. The clothing should be light and porous, and the head protected, when working in the sun, by placing a green leaf, wet, cool cloths or sponges in the hat. Water should be drunk freely. When the slightest symptoms of dizziness, headache or exhaustion are manifest, the individual should at once quit work, and seek rest in the shade. If perspiration ceases, rest and a cool bath should be secured at once.

Treatment of the Attack. — In *heat exhaustion* the patient should be placed in bed, or in a shady place, and be given stimulants, such as alcohol, nitroglycerin and aromatic spirits of ammonia. A hot bath or hot-water bags are desirable. If the heart action is very weak, strychnia and digitalis may be necessary.

In *heat-stroke* the most important consideration is to reduce the high temperature as rapidly as possible. To this end the patient should be rubbed with ice, or placed in an ice bath, or be given ice-water douches. This treatment should be abated as soon as the temperature falls to about 102° F. (per rectum), and renewed again as soon as the temperature rises above that point. Meanwhile the patient should be placed on a cot or mattress, rubbed dry and covered with a sheet. An ice-cap should be kept constantly on the head, and, if the patient can swallow, he should be given pieces of ice in the mouth. After the temperature has apparently been reduced permanently, but diaphoresis does not occur, the patient may be given a hot bath. Antipyretics should not be employed.

In asphyxial cases the ice treatment is not indicated. In these, hot baths and hot-water bags may be required, with stimulants as recommended in heat-exhaustion. Anders suggests that artificial respiration should be kept up until other measures and stimulants have time to act.

The treatment of special symptoms and the sequelæ of heat-stroke is purely symptomatic.

Therapeutics. — The homœopathic physician should not forget that he possesses in his armamentarium remedies of great value, not only for the more remote consequences of heat-stroke, but for the immediate attack.

Glonoine (3x). — This is our most important remedy. It stimulates the vasomotor centers and the heart, producing an active hyperemia, but does not go on to active inflammation and fever. It is, therefore, particularly useful in the asphyxial form of heat-stroke, but is not adapted to the apoplectic form, which rather calls for *Belladonna* or *Veratrum viride*. In glonoine the face is pale, and, while there is a severe bursting or crushing pain, the chief characteristic is a throbbing or pulsation all through the head with every beat of the pulse, and which is not painful; also a sort of undulatory or wave-like motion in the brain. Sometimes the attack comes on suddenly, the patient becomes dizzy and loses his way, or, more often, falls down unconscious. There may be labored respiration and convulsions. It is also often valuable for the after-effects of heat-stroke.

Belladonna (3x). — This is the remedy that is most often useful in the apoplectic form, except when the hyperpyrexia and other symptoms demand *Veratrum viride*. I do not agree with Dewey and others that *Belladonna* is similar to *Glonoine*. It produces an actual and violent congestion with violent pain in the head, flushed face, throbbing carotids and bounding pulse; while with *Glonoine* the face is pale, and there is a tendency to syncope, the congestion being more apparent than real. Under *Belladonna* there may be, also, loss of consciousness and convulsions.

Veratrum viride (1x). — This remedy is most useful in apoplectic cases marked by hyperpyrexia, intense congestion, even to meningitis, and incompressible pulse. Vomiting and convulsions may be present.

Gelsemium (1x). — This is the chief remedy in heat exhaustion. There is great prostration, soft pulse, vertigo, blurred vision, fullness and weight in the head; also for the nervous irritation, palpitation, oppression, muscular pains, etc., which sometimes occur as sequelæ of heat-stroke.

Ferrum phos. (3x). — Headache and symptoms of cerebral congestion, but lacking the violence of *Belladonna* or *Veratrum*. The face is red, there is dizziness and often vomiting.

Natrum carb. (3x). — This is an invaluable remedy in the treatment of the after-effects of heat-stroke; — mental weakness, loss of memory, melancholia, prostration, headache, etc., also when these

symptoms always come on in hot weather, even though there be no history of a previous sunstroke.

Zincum phos. (6x). — This is a valuable remedy for the remote consequences of heat-stroke, vertigo, uncertain gait, difficult concentration of the mind, depression of spirits, etc.

Also consult: *Aconite* (2x), *Amyl. nitrite* (3x), *Lachesis* (6.), *Stram.* (3x), *Tabacum* (2x) and *Theridion* (3x).

SECTION X.

DISEASES OF THE NERVOUS SYSTEM.

GENERAL DIAGNOSIS.

The first consideration as regards the Nervous System should be the prevention of disease.

Bearing in mind the fact that all functions of all organs are controlled in the main through the nervous man, we must recognize that only by considering the entire man in all his relations, in all his parts, mental as well as physical, and by careful study of all that can in any way affect any organ can we learn how to keep it in working harmony.

Self-control is the most important and potent factor in the prevention of this class of diseases. It should be thoroughly instilled in the youngest infant, and be a constant part of the training as long as life lasts.

The physician should know and carefully consider all that can influence the life in any way; this means that he should know all that there may be in the heredity, know the tendencies with which the child is born, should know of the environments and of the predispositions they may produce; and should then undertake to regulate the lives of all who may come under his guidance or care, in such a way as to, so far as possible, overcome these tendencies and predispositions.

By careful study and guidance of the composite man, diseases of the nervous system could be very greatly minimized.

It is essential in order to study disturbances of the nervous system with a clear understanding, to have a proper conception of the anatomy and physiology. One should know the histological and the pathological anatomy; should have a clear comprehension of the character of the various pathological conditions, and the manner in which they may or necessarily do interfere with function. One should also have a clear idea of pathological changes, in order to determine the probability or possibility of restoration to normal conditions.

There is no department of medicine in which the reasoning powers of the physician will be more severely taxed. It is often, only after repeated examinations and interviews, that a clear picture of the exact conditions can be obtained. This is especially the case in the so-called functional disturbances.

It is of the utmost importance that the examiner have a thorough knowledge of everything that could by any possibility influence the patient, mentally or physically, that could have in any way interfered with perfect harmonious development.

Remember it is the whole man working in perfect harmony in every part, that can be considered as perfectly healthy, and that any one part being out of order may influence markedly through the nervous system any other part, and must to some extent affect every part.

To Take the History.—In order that nothing that may be of importance shall fail to be noticed, a careful chronological history of the patient, including the heredity, and of the ailment for which advice is sought, should be taken.

The physician should all through the taking of the history and making his examination carefully refrain from forming any conclusion. It is difficult to frame questions or make physical examinations in such a manner as to get the absolute facts, and give each its due weight in forming an opinion, unless you can keep your own mind absolutely free from bias.

Family History.—Name, age, sex, nationality, occupation and social state of the patient.

The age or date of the death of the father of the patient, and cause or probable cause of death. The general health of father and of his family, parents, brothers and sisters. Ask particularly as to any special tendencies to any disease and as to temperament and peculiarities.

The same as regards the mother. Do not forget that the occurrence of debilitating diseases, such as tuberculosis, gout, rheumatism, diabetes and Bright's disease may be significant factors in forming a predisposition to either functional or organic disease of the nervous system.

Inherited syphilis, it should be remembered, does more; it almost certainly entails some modification in the growth, development and nutrition of the cerebral and spinal systems, leading often to histological changes.

That which is transmitted in the main by heredity is the neuropathic constitution, a low resistance to those things capable of deranging the nervous system. Ascertain, if possible, conditions of parents about time of conception, the general condition of mother during the preg-

nancy, also as to any accidents or frights during that time, the character of the labor and the condition of patient at birth.

From this point follow the history of patient to the present time as to general health, habits, attacks of sickness and recovery from same, and the presence of sequelæ.

Take up the school life and any possible influence study may have had. In females take up the menstrual life in all its phases, pregnancies, miscarriages, labors and recoveries from them, evidences of female trouble, in fact, everything that could in any way influence the health.

History of Present Malady. — Commence with the very first indications of a departure from health and follow step by step each indication in its order of appearance to the present time. Take very carefully every symptom, objective or subjective, you can get from the patient or friends. Note very carefully all idiosyncracies and peculiarities.

Physical Examination.—A very careful inspection of the entire form should always be made in order to note any want of symmetry, dislocations, curvatures, evidences of degeneration and the like. Note facial expression, in fact, the entire physiognomy of the patient.

The eyes should be examined for refractive errors, muscular inefficiencies, and with the ophthalmoscope for the appearance of the disk and the reaction of the pupils to light.

The nose and throat should be carefully looked into for deviation, growths or sources of irritation. In children look particularly for adenoid growths. Examine the ears as well.

The condition of the gums and teeth, as to indications of syphilis or metallic poisoning, such as lead, mercury or phosphorus. The tongue may not only indicate disturbances in the digestive tract, but gives marked indications of neural disturbance, in twitching or a peculiar tremor or deviation of the point on protrusion.

The chest should be carefully examined as to the conditions of the lungs and heart. The abdomen should be carefully percussed and palpated as to condition of the liver and spleen, malposition of any organs, areas of dullness and especially sensitive points.

Then the generative organs for any malformations, congenital or acquired, adhesions of prepuce or clitoris, displacements and inflammations. The rectum should never be overlooked, the physician should always know whether it is in normal condition.

Muscular.—Careful comparison of entire members of the two sides should be made, note in general, relative size of the members, and whether there are grooves or sunken spots on one side, not on its fellow, enlarged or knotty joints and the relative hardness, determine

whether the member on one side is more flabby than its fellow. Bear in mind that the right side is usually a little larger and firmer than the left.

Muscular Tone. — A muscle may be increased or diminished in tone. We test the tone of a muscle through the deep reflexes and passive movements. The patient's attention should be diverted, the member fully supported by the operator and completely relaxed. Any voluntary or involuntary effort or muscular contraction on the part of the patient will interfere and must be avoided. Move each member at each joint in every possible direction, and observe carefully the ease with which you can make the movements, or the amount of resistance to each motion. If the muscle tone is increased, you will find a greater than average resistance; if lowered, a less than average resistance. In any case repeated efforts is likely to reduce resistance. There is likely to be greater resistance to rapid than to slow movements.

Deep Reflexes. — Patellar tendon reflex, knee jerk. Many authors claim this to be present in all persons in perfect health. There are cases, I am sure, where this is not the case, but they are very uncommon. The test in young children is very unsatisfactory. The test may be made with the patient either sitting on a place sufficiently elevated to allow the feet to swing freely clear of the floor, the calves not resting against anything, or, reclining on the back with the heel resting on the couch, bed or table, the knee supported in a semiflexion by the hand of the operator underneath.

The patellar tendon is outlined with the fingers and then tapped with the edge of the hand, with the back of a narrow book, or with a percussion hammer. If the reflex is present the foot will suddenly jump forward immediately following the strike on the tendon, or there will be at the same time a contraction of the extensor cruris muscle in the upper thigh. The patient's eyes should be closed so that the stroke can not be seen, and the attention attracted by any means, in order to prevent voluntary movement, or a muscular tension interfering with the reflex movement or contraction.

The absence of this reflex is abnormal and shows a very low muscular tone, often due to break in reflex chain. The presence in a very marked degree is abnormal and indicates increased muscle tone from irritation.

A considerable latitude must be allowed for, under normal conditions. Painful conditions, particularly in the legs, usually increase the knee jerk without in any way indicating nerve trouble. If it seems impossible to overcome a marked rigidity and resistance to passive motion, other evidences of a spastic condition must be looked for.

Ankle Clonus.—The essential element in producing this tendon reflex is the putting of the tendo achillis on a continued moderate stretch, which results when the clonus is present, in nearly rhythmic flexion and extension of the foot on the ankle. The knee should be in semiflexion, and the foot flexed on the ankle with some force, but not too much, and held there for a little time. The absence of this is not abnormal, as it is very rarely present in health. Its presence usually indicates some neural lesion, but not necessarily.

The tendon reflexes of the upper extremity, while of value to the neurologist and the student, are too uncertain to be of value to the general practitioner.

Active Movements.—The physician should always notice the gait of every patient on entering or leaving the office, especially at times when patient is not aware that he is under surveillance. It not infrequently happens that more accurate information is gained in this way than by the most careful scientific tests. While taking the history every movement of the patient should be observed, every facial expression, the manner of speech, in short, everything about him.

If any peculiarities of gait, motion, or expression are noticed, make careful inquiry and examination as to the cause. There may be peculiarities not the result of any nervous disease. There may be joint disease producing immobility, spasm or rigidity. It not infrequently happens that pain will cause a simulation of paralysis.

To make the examination of motion in the legs have patient lie flat on the back, bare the legs, and have him make every possible motion with one and then with the other, and then with both legs as rapidly as possible. You can learn in this way just how quickly each movement can be made, as well as just what motion can or can not be made or can only be partly made.

There is no instrument by which the physician can test the strength of various muscles as accurately and conveniently as by his own handling and sense of resistance. By grasping the foot or the hand and having the patient undertake to make voluntary movements in every direction, the physician at the same time resisting the movement and noting how much force is required to prevent it. Then have the patient resist while the physician makes passive movements in every possible direction, noting how much force is required to overcome the resistance of the patient. A very little practice will enable one to determine the relative muscular force better than by the use of any instrument with which I am familiar.

Bear in mind that unless the patient is left-handed, the force of the right side all through is normally the greater. Note carefully all muscles that should take part in any given movement.

I find in Oppenheim a very carefully prepared, concise, and accurate statement of the muscular function, which I am pleased to copy here.

Muscular Functions.

Muscles of the Shoulder and Arm.—The trapezius muscles, acting together, raise the shoulders and bring the shoulder blades toward the median line. Acting singly, the trapezius lifts the shoulder of the same side, draws the head backward and at the same time turns it slightly toward the opposite side; for instance, the contraction of the right trapezius turns the chin toward the left.

The clavicular portion, which extends from the occiput to the outer third of the clavicle, moves the head in the above manner when the shoulders are fixed. It is called the respiratory portion because it aids in deep respiration. When paralyzed, the shoulder is immovable during breathing. The middle portion, which extends from the ligamentum nuchæ and the three upper dorsal vertebræ to the acromion and outer portion of the spine of the scapula, elevates the shoulder blade. When well developed, a short neck is the result. In paralysis of this part the acromion sinks from the weight of the arm, as it is no longer fixed by this muscle. The inner lower angle approaches the median line; the inner upper angle is raised by the levator anguli scapulæ. The shoulder is depressed forward and downward. There is difficulty in raising the arm, and depression of the shoulder produces pain.

Lower Portion.—This extends from the fourth dorsal vertebræ and below it to the inner half of the scapular spine. It draws the shoulder blade toward the median line. When its action is impaired, the inner border of the scapula is about ten to twelve centimeters distant from the middle line. The back is broadened and the clavicles are especially prominent; i. e., the acromial end describes an arc and makes a straight line with the sternal end.

The Levator Anguli Scapulæ draws the inner superior angle of the shoulder blade upward, and assists, especially in paralysis of the trapezius, in shrugging the shoulders. It is rarely involved alone. Isolated paralysis of it need not cause any particular disturbance. I saw one case with paralysis of this muscle and paresis of the rhomboidei in which there was a false position of the shoulder blade, the superior inner angle standing lower and being farther from the median line than on the sound side.

The *rhomboidei* elevate the scapulæ, and draw them toward the median line.

The *serratus anticus major* rotates the shoulder blade around its

sagittal axis, so that the lower border is turned outward and the acromion is raised. It also holds the scapula on the thorax, uniting the inner border with the ribs. It slightly elevates the shoulder blade. In paralysis of this muscle, when at rest, the scapula is higher than normal; its inner border is nearer the vertebræ; the lower edge more so than the upper, so that the inner border runs from below and inward, upward and outward.

The paralysis is very marked upon attempts at certain movements and the position resulting therefrom : —

1. Upon abduction of the arms until a horizontal position is reached, the shoulder blade approaches nearer to the vertebral column, the inner border raises itself and at the same time pushes the trapezius and rhomboidei forward.

2. The arm can not be raised above a horizontal position, because the rotation of the shoulder blade necessary for further movement is absent. If, however, the lower border of the scapula be forced outward, the arm can be raised to a vertical position.

3. Upon attempting to stretch the arm forward, the scapula lifts itself with its inner border, "wing-like," from the thorax, sometimes to such a degree that the hand can be placed between the scapula and the thorax. There are some cases of serratus paralysis on record in which the arm could be raised to a vertical position. It is thought that the middle portion of the trapezius rotates the shoulder blade outward in these cases.

The *deltoid* lifts the arm outward, forward, or backward, according as the middle, anterior, or posterior division contracts. The raising of the arm, however, does not extend beyond the horizontal. The posterior division does not even bring it that far. It is necessary for the action of the deltoid that the scapula be fixed by the serratus, and especially by the trapezius, as from paralysis of the latter the deltoid loses its support on the acromion process, and pulls it down instead of raising the arm. The deltoid is an antagonist of the serratus anticus. In paralysis of the deltoid, the arm can not be abducted, nor elevated backward nor forward. (The latissimus dorsi does not raise the hand farther than the gluteal region, and upon attempts to lift the arm the shoulder in toto is raised, while the arm remains besides the thorax.) Anteriorly and posteriorly, however, through the action of the supraspinatus, it can be slightly elevated. In a chronic deltoid paralysis there ensues a subluxation of the head of the humerus, and the shoulder dangles loosely. When the deltoid and supraspinatus are paralyzed conjointly, this flattening and subluxation occurs more easily.

The *infraspinatus* and *teres minor* are external rotators; the sub-

scapular rotates the arm inward. Atrophy of the subscapularis betrays itself by the crackling noise caused by the rubbing of the scapula on the ribs during movements of the shoulder blades. Many healthy persons, however, are able to reproduce such a sound by the same motion. Paralysis of the infraspinatus produces difficulty in writing.

The *pectoralis major* draws the arm toward the thorax. The clavicular portion helps to depress the elevated arm to a horizontal position and from there inward. With the arm at rest it draws the acromion forward and upward, as in the carrying of burdens. The sternal end draws the arm from the vertical position downward, and when the arm is at the side moves the acromion forward and downward.

In paralysis of the *pectoralis major* no movement is entirely prevented, but abduction of the arms is performed imperfectly. (Remember that the anterior portion of the deltoid, the *teres major*, and the *rhomboidei* can replace part of the functions of the *pectoralis major*.) In order to detect the paralysis, we ask the patient to extend both arms forward and press his arms together. This, if it can be accomplished, is done with but little force.

The *latissimus dorsi* draws the elevated arm backward and downward, the depressed arm inward and backward; acting singly, it pulls the dorsal end of the trunk to one side, and extends it when acting conjointly.

The *teres major* adducts the arm toward the trunk, provided the shoulder blade is fixed; draws the scapula outward when the depressed arm is fixed, and rotates it so that the acromion, and therefore, the shoulder is raised. Paralysis of it does not cause much disturbance. The long head of the triceps and the *coracobrachialis* belong to those muscles which support the head of the humerus in the capsule, and antagonize any subluxation of the humerus which would result from the action of the *latissimus dorsi* and the *pectoralis major*. If atrophied, when the arm is forcibly drawn downward the head of the humerus is subluxated downward; more so if at the same time a paralysis of the deltoid exists.

The *brachial triceps* is the extensor of the forearm. If paralyzed, the arm can only be extended by its own weight. As soon as resistance is offered, or the arm is held vertically above the head, it is impossible to extend the forearm.

The *internal brachial* flexes the forearm without pronating or supinating it. The brachial biceps flexes and supinates at the same time, while the *supinator longus* slightly pronates and then flexes it. These muscles are equally contracted in forcible flexion. If, during flexion, pronation or supination occurs at the same time, one of these muscles

is deficient. If all three are paralyzed, slight flexion may still occur, provided the flexors of the hand and fingers which arise from the internal condyle of the humerus, and also the pronator teres, forcibly contract while the hand is fixed by their antagonists. The extensors of the hand and fingers can also promote flexion of the forearm after the latter is pronated and the wrist is fixed in an extended or flexed position. This artificial flexion from the fact that it is impossible in the ordinary position of the hand and fingers, is easily recognized.

If the biceps alone is paralyzed, the forearm may be strongly flexed, but the patient tires easily and complains of pain in the shoulder. Paralysis of the supinator longus is recognized by the fact that in forcible flexion of the forearm against resistance the muscle does not show prominently. Its atrophy gives a spindle shape to the forearm.

The *supinator brevis* supinates the hand with extended forearm. The pronator teres and the pronator quadratus are real pronators.

The *extensor carpi radialis longus* extends the hand and at the same time draws it toward the radial side; the *extensor carpi ulnaris* extends the hand and draws it toward the ulnar side. The *extensor carpi radialis brevis* alone is a simple extensor.

When all the extensors are paralyzed, the hand hangs by the side; and when passively raised, falls again to this position when let go. The palmar pressure is weak because the flexors of the fingers can only be brought into complete action in extension of the hand. If the hand is passively brought into extension, the palmar pressure is correspondingly increased.

The *extensor communis digitorum*, as well as the *extensor indicis* and *extensor minimi digiti*, extend the last phalanges and slightly separate the fingers from each other, abducting them from the middle finger.

In strong contraction of the *extensor communis digitorum*, the hand, at the wrist joint, is slightly extended. The *extensor communis digitorum* has nothing to do with the extension of the second and third phalanx.

The *flexor carpi radialis* flexes the hand and slightly pronates it, so that the palm is slightly turned ulnarward; the *palmaris longus* simply flexes the hand, while the *flexor carpi ulnaris* flexes, especially the ulnar side of the hand and supinates the hand so that the palmar surface looks to the radial side. The fifth metacarpal bone is also flexed upon the carpal by this muscle. Paralysis of the flexors of the hand does not cause much anomaly of position, as the hand flexes by its own weight. If the flexors of the fingers are intact, they, to a certain degree, may assume the functions of the paralyzed flexors of the hand.

The *flexor sublimis digitorum* flexes the second, the *flexor pro-*

fundus digitorum the last two phalanges. They have nothing to do with flexion of the first phalanx, except in extreme extension or when the other phalanges, notwithstanding their contraction, remain extended, when they cause also a flexion of the first phalanx. The flexors act the stronger the greater the extension of the hand.

In paralysis of the *flexor sublimis digitorum* the second phalanx can from overweight of the extensors (interossei) gradually be flexed toward the first and even subluxated; in paralysis of the flexor profundus this subluxation can happen between the second and third phalanges, yet is rarely seen, because an isolated paralysis of these muscles is uncommon.

It is important to know perfectly the functions of the interossei and lumbricales, because these are affected so often and in the most varied forms of disease. The external and internal interossei produce abduction and separation of the fingers. The movement is only complete when the hand is extended at the metacarpo-phalangeal joint. If, therefore, you desire to test this function when the extensor communis digitorum is paralyzed, you must extend the fingers passively, and with the hand supported on something (the hand of the examiner will do), you can proceed to have him adduct and abduct the fingers. Another important function of these muscles is to *flex the basal phalanges, and at the same time extend the second and third phalanges of the fingers*. In doing this they are assisted by the lumbricales.

In incomplete paralysis of these muscles the lateral movement to the fingers suffers. With increasing paresis the extension of both interphalangeal joints is hampered and a characteristic deformity ensues. In normal persons the hand at rest is slightly flexed at all joints; in paralysis of the interossei (and lumbricales) the basal phalanges are flexed, the middle ones more than the last. Finally, the antagonists (the extensor communis digitorum on the one hand and the long flexors of the fingers on the other) gain the ascendancy and draw the first phalanx into extreme extension, while the second and third are held firmly flexed (griffen-hand, claw-hand, *main en griffe*).

The Muscles of the Thumb.—The *extensor longus pollicis* extends both phalanges of the thumb, and draws the whole thumb backward. If paralyzed the metacarpal bone of the thumb inclines forward and the second phalanx is flexed against the first. It can, however, still be extended, provided the adductor and flexor brevis are brought into action, the metacarpal bone being kept flexed and abducted, the first phalanx being also flexed. Extension of the first and the second phalanx is not possible at the same time.

The *extensor brevis pollicis* is an abductor of the thumb; it brings

the first metacarpal directly outward, extends the first phalanx, but has no influence over the second. Paralysis of this muscle is only of importance when the abductor longus pollicis is paralyzed synchronously. This latter also moves the metacarpal outward and at the same time forward; i. e., flexes it toward the wrist-joint, and with maximal contraction is a flexor of the hand. If the adductor longus pollicis and the extensor brevis pollicis are paralyzed, the thumb is abducted and a "volar hand" results.

The *flexor longus pollicis* flexes the second phalanx of the thumb. Its paralysis prevents this motion and hinders writing, etc.

Those muscles of the ball of the thumb which are inserted on the radial side of the first phalanx and metacarpal bone have the duty of moving the first metacarpal forward and backward, and of flexing the first phalanx and rotating it so that it is in apposition to the fingers.

The *opponens pollicis* merely moves the first metacarpal bone forward and inward, so that it remains directly opposite the second. The assistance of the abductor brevis and the outer part of the flexor brevis is necessary for the complete apposition of the wrist. In paralysis of all the muscles of the ball of the thumb the metacarpal bone of the thumb is brought into the same plane as the other metacarpals from the action of the extensor longus pollicis (ape hand). In paralysis of the abductor brevis and the opponens pollicis slight opposition through the flexor brevis is possible, but flexion of the first metacarpal is so incomplete that the thumb can only touch the tips of the other fingers when these are flexed at the interphalangeal joints.

If the adductor is paralyzed, the first metacarpal is separated more than usual from the second, and can not approach it in a flexed position—as, for instance, if the patient desires to hold a cane.

The Muscles of the Pelvis and Lower Extremity.—The gluteus maximus extends the thigh and slightly rotates it outward. With fixed limbs it extends the flexed trunk. This muscle acts especially in climbing stairs, running, arising from a chair, etc., and its paralysis hampers these movements. If, in paralysis of the glutei, the patient attempts to climb upon a chair, the pelvis inclines strongly forward. The gluteus medius is an abductor more than anything else. If the anterior portion contracts, the thigh is drawn forward and outward, and at the same time rotates slightly inward; the posterior part draws the thigh backward and outward, and rotates it outward. With fixed leg it draws the trunk to one side. The gluteus minimus has a similar action.

When these muscles are paralyzed, the leg can not be abducted. In walking, the leg swings too far inward.

Especially noticeable is the excessive lifting and sinking of the pelvis in walking — the waddling gait. The pelvis inclines to the opposite side from the paralysis in one-sided affections; when both sides are paralyzed, it inclines during walking to the side of the swinging-leg.

The *pyriformis*, *gemelli*, *internal and external obturators*, as well as the *quadratus femoris*, rotate the upper thigh outward. If paralyzed, the leg is turned continuously inward.

The *ileo-psoas* flexes the leg at the hip joint, and turns the thigh slightly outward, the tensor fasciæ latæ exercising at the same time a slight rotation inward. If both flexors are paralyzed, walking is impossible; if paresis only exists, walking is hindered, and the thigh can not be raised when in the reclining position the leg is held extended.

The *pectineus*, *adductors* and *gracilis* adduct the thigh. The pectineus adducts and flexes at the same time. The *adductor longus* and *brevis* only slightly flex. All three cause a slight rotation of the leg outward. The *adductor magnus* draws the leg directly inward; its under portion rotates the leg inward.

Adduction of the leg is prevented by paralysis of the adductors. It also is turned outward from overweight of the abductors. In a paralysis which involves only the lower portion of the adductor magnus adduction is accompanied by outward rotation.

The *quadriceps femoris* extends the lower leg. The rectus femoris is a strong flexor of the hips when the lower leg is extended. In paralysis of the extensor standing is possible with extended knee; walking is also possible, but with difficulty. The limb must be kept extended, as an upright position would be impossible as soon as the flexors were brought into action. The stride is shortened to prevent flexion, as a long, swinging gait requires flexion of the knee.

Paresis of the quadriceps produces excessive flexion of the lower leg in walking; the difficulty is decreased by the use of crutches or canes. To recognize paralysis of the quadriceps, extend the lower leg of the reclining patient, the thigh being flexed on the pelvis. The sole must not rest on anything. In sitting, the lower leg can not be extended; and after being passively raised, instantly drops again. Arising from a kneeling position is impossible, or in incomplete paralysis only possible by the patient placing his hands on his knees and pressing these backward.

If the *vastus internus* is paralyzed alone, extension will draw the patella laterally by the action of the vastus externus. It may even result in luxation of the patella. Even in laceration of the ligamentum patellæ, a slight extension of the lower leg is possible, by reason of the muscular fibers passing from the vasti to the sides of the tibia.

The *sartorius* causes flexion of the hip and knee joints, and rotates the thigh outward; its action is an incomplete one. The *gracilis* flexes the lower leg slightly, adducts the leg more, and rotates it inward. The biceps, *semitendinosus*, and *semimembranosus* are flexors of the lower leg and extensors of the hip. They extend the hip joint in ordinary walking (the glutei, etc., in climbing stairs). In paralysis of these muscles the pelvis would incline forward, if the patient did not instinctively by bending backward displace his center of gravity backward. As the leg can not be actively flexed any longer, the flexion is made easier by bending the hip joint more than normally; the lower limb, by reason of its weight, then becomes bent. If the leg is stood upon, the quadriceps receive the most weight and the extension of the knee forces the leg into slight retroflexion. Walking, running, dancing, etc., are impossible.

The *popliteus* rotates the lower leg, when flexed, inward, and flexes it itself only slightly.

The *triceps suræ* (*gastrocnemius*, *plantaris* and *solcus*) promote plantar flexion and adduction of the foot. The foot also will be so turned that the dorsal surface looks outward. In simple plantar flexion the peroneus longus is also called into action. Its action is more forcible with extended knee (the gastrocnemius, which is inserted into the femur, slightly bends the knee); when the lower leg is bent upon the thigh, the soleus acts alone.

In paralysis of the triceps suræ flexion of the foot is almost impossible, and is never more than ninety degrees. The peroneus longus draws the first metatarsal downward, and causes valgus. Gradually, through the extensors (the dorsal flexors), a hatchet-foot is produced. Contracture of the antagonists, however, does not always follow. The patient can not raise himself upon his toes; walking is difficult for him. A secondary shortening of the muscles and fasciæ of the plantar region follows, and, resulting therefrom, a marked arching of this region.

The *peroneus longus* has little to do with the extension of the foot; it is especially an abductor. It depresses the inner and elevates the outer border, and draws the head of the first metatarsal downward and outward, thus decreasing the size of the anterior foot and increasing thereby the arch of the foot.

In paralysis of this muscle, extension of the foot takes place with adduction; the inner side of the front part of the foot is not supported any longer, and sinks from the pressure. In walking, the foot only touches the floor with the outer border; the head of the first metacarpal is raised from the floor and the great toe is strongly flexed. The plan-

tar arch decreases from standing, a flat-foot condition resulting. Walking is fatiguing, standing on the toes is not possible, or uncertain.

Pressure in walking upon the nerves of the plantar surface produces paresthesia and pain.

The tibialis anticus, extensor longus digitorum and extensor hallucis longus produce extension of the foot. The tibialis anticus is at the same time an adductor; it draws the head of the first metatarsal upward and inward, and lifts the inner border of the anterior part of the foot (at the same time the toes, especially the great toe, being flexed). The extensor longus digitorum extends to four toes slightly, but it is especially an extensor of the foot; it also lifts the outer border and abducts the foot. The extensor longus hallucis causes dorsal flexion of the first phalanx of the great toe, and at the same time aids in extension and adduction of the foot.

In paralysis of these muscles the foot can not be raised; it hangs flaccid as soon as raised from the floor. In walking, the toes catch on the floor. To prevent this, the leg in walking is flexed at both hip and knee. The gait appears very peculiar for this reason (a beginner would regard it as ataxic). In chronic paralysis contracture of the flexors results, and from this pes equinus (pes equino-varus if the peroneus is paralyzed at the same time) is caused. This deformity gradually becomes a permanent one.

If only the tibialis anticus is paralyzed, extension of the foot is combined with adduction. The long extensors of the toes, especially the extensor hallucis longus, are excessively stretched, the first phalanx of the large toe being chronically extended.

In isolated paralysis of the extensor longus digitorum, dorsal flexion exists conjointly with abduction. The peroneus brevis abducts the foot and slightly raises its outer border, without flexing or extending it.

The tibialis posticus adducts the foot without extending or flexing it; at the same time the outer border is rendered convex, and the head of the talus appears upon the back of the foot.

The paralysis of these muscles (the peroneus brevis and tibialis posticus) prevents simple adduction or abduction unaccompanied by flexion and extension, and produces, in time, deformity.

The functions of the foot are more severely harmed by loss of power of single muscles or muscle-groups than by paralysis of all the muscles of the foot, because in the latter case no extensive deformity occurs, but only a slight pes valgus is produced, since from the weight of the body the calcaneus is forced slightly outward. Inasmuch as for the development of the secondary contractures the erect posture is the cri-

terion, this description does not apply to those who are bedridden. Provided the foot is fixed at a right angle to the leg by an appropriate surgical shoe, walking is possible.

The short extensor communis digitorum of the foot draws the toes farther dorsalward than does the long muscle of the same name.

The interossei pedis and the lumbricales produce not only abduction and adduction of the toes, but flex the first phalanx, while they extend the second and third.

The flexors digitorum (long and short), as well as the flexor hallucis longus, flex the last phalanges plantarward.

The adductor, flexor brevis, and abductor hallucis flex the first phalanx of the great toe and extend the second. The abductor and the inner head of the flexor brevis move the large toe inward, adductor outward. These muscles contract in contraction of the foot preparatory to pushing it from the floor. If the extensors of the toes are paralyzed, the interossei become chronically contracted; the first phalanges are flexed, the last extended, thus producing an abnormal position of the toes. In paralysis of the interossei, the first phalanges are hyperextended and their heads subluxated, the second and third flexed (claw-foot). Walking is not impeded, but is painful. Walking and running are considerably influenced.

Muscles Which Move the Head and Vertebrae.—The functions of the following are especially noteworthy.

The sternocleidomastoid turns the face to the opposite side, so that the chin is inclined and raised on that side, while the head inclines to the same side as the muscle, on which side the ear is at a lower level than on the other. If these muscles contract simultaneously, they bring the dorsally inclined head forward with elevation of the chin. If it is desired to test their function, have the patient recline, and then ask him to lift his head at the same time resisting his efforts by pressure on the chin.

Their contour is so plainly evident under the skin that their contraction is easily seen; but do not rely upon this, as often they may be normally developed and yet not seen.

Unilateral paralysis need not cause any abnormal position of the head, but generally the head is held in a position corresponding to the function of the muscle of the other side, and if kept there, contracture may result. In paralysis on both sides, the head, which is strongly inclined backward, can be with difficulty bent forward.

The recti capitis anticus (major and minor) flex the head in the atlanto-occipital joint.

The rectus capitis lateralis bends the head to the side.

The longus colli is a flexor of the neck.

The rectus capitis posticus moves the head backward.

The obliquus capitis inferior or major rotates the head.

The biventer cervicis and complexus major draw the head backward.

The splenius capitis et colli draws the head backward, and at the same time turns it toward the side of the contracted muscles.

The sacrolumbar and longissimus dorsi extend the lumbar and lower dorsal vertebræ. In unilateral action the vertebræ are drawn backward and to the side of the contracted muscles, so that the lower part of the spinal column as high as the eighth dorsal becomes twisted, and its convexity looks toward the opposite side.

The semispinalis dorsi and the multifidus spinæ are rotators of the vertebral column.

The quadratus lumborum bends the lower vertebral column toward the side.

If the erector trunci of both sides is paralyzed, the back in walking and standing, is thrown backward so that a plumb line from the third dorsal vertebræ falls behind the os sacrum, the pelvis at the same time raised (action of the abdominal muscles).

There is present slight lordosis of the spinal column, which disappears on reclining. On sitting, the spinal column is arched convexly backward, and the patient prevents himself from falling forward by supporting himself with his hands.

Paralysis of the abdominal muscles causes lordosis also, but a plumb line from the dorsal vertebræ falls on the middle of the os sacrum, because the pelvis is strongly bent forward. The abdomen and nates show up prominently.

It is only possible to rise from a reclining position by using the arms as a support.

Paralysis of the abdominal muscles also influences respiration, especially forced expirations, as in coughing, singing, and screaming, which are no more possible. The passing of the stools and urine is also hampered.

Inasmuch as the viscera which push the flaccid abdominal wall before it do not furnish sufficient support to the diaphragm, the latter is unable to raise the ribs, but narrows the thoracic base."

Disturbance of Co-ordination. — This may exist either with or without loss of muscular strength.

In perfect co-ordination each muscle must do its part, relax or contract to just the right degree. Every voluntary motion of each member requires co-ordination in order to be as it should.

It is the case at times that paralysis of one or more muscles may interfere with perfect co-ordination. All the fine movements, as writing, drawing, singing, etc., are possible only by the most perfect co-ordination. There being no paralysis present, an inability to execute any certain movement with precision must be due to an imperfect co-ordination. Co-ordination is in a degree the result of education of constant and repeated effort. There must be consciously or unconsciously a correct mental picture of the movement desired.

It will at once be seen that there is a certain amount of inability to co-ordinate certain muscular movements in perfect health.

The inco-ordination of disease is that in which there is failure in the co-ordination of the ordinary movements; those that have been educated have been normal. This is characterized by an unusual lavish expenditure of muscular strength, not in an ordinary simple way; muscles are called into use that ordinarily have no part or even may usually inhibit, the particular movement attempted.

The examination for ataxia, which is abnormal inco-ordination, should be made with the patient's eyes closed. The eyes help in the formation of a perfect mental picture, and this assists in the right impulse being given, for the correction of wrong movements. In slight ataxia, co-ordination may be perfect with the eyes open and fixed on the member to be used, but very imperfect with the eyes closed.

Have the patient stand with the feet close together, heels and toes, eyes closed; if ataxia be present, he is likely to sway, may even fall. Have him raise one foot; he will find it impossible to stand on one leg. Have him try to place one foot on a given spot, as the rung of a chair; he may do so, but with an irregular, jerky movement. Have him walk across the room and back with the eyes closed; you will find that he staggers more or less, and that the irregular, jerky movements of the legs are exaggerated.

With the patient in a reclining position, with the eyes closed if ataxia be present, he will be unable to lift his leg up in a straight line, it will be adducted, abducted or rotated, outward or inward, with a constant tendency to sway from side to side.

Tremor. — Is practically present at all times in everyone when awake, but is not usually manifest. It, of course, is never called to the attention of the physician under these circumstances. It may become manifest without any pathological lesion to cause it. It may become manifest under perfectly normal conditions. Holding a member in an unnatural and unsupported position steadily for a considerable time, putting a muscle or set of muscles under heavy, continuous strain for a long time, as in holding a heavy weight,

marked overexertion of any kind or strong emotion may produce a normal manifest tremor.

During convalescence from wasting disease, following excesses of any kind, especially cold in the emaciated, we may have what may be termed a normal, manifest tremor.

They may be the result of hysteria, or of some toxic influence or of certain pathological changes in the nervous system.

We recognize them as rapid or slow, as fine or coarse, usually the rapid and fine go together and the slow and coarse, but not always. We also have the fibrillary, which is of a single bundle of muscular fibers, or of a wave passing rapidly from one bundle to another until the entire muscle is affected.

Bear in mind that an inherited tremor may exist, which is seemingly absolutely normal. I will defer more special tremor to the chapters on various topics, Hysteria, Paralysis Agitans and Multiple Sclerosis.

The electrical examination, for the details of this I refer to the works on Electrotherapeutics.

Examination of Sensibility. — For sensation to touch, and to determine the ability of the patient to locate it, the tip of the finger is probably the best instrument. In babies and very young children this sense is not as a rule well developed. On every part of the body except cicatrices and where the skin is particularly thick, as on the ball of the great toe, for instance, everyone should be able to recognize promptly a light touch of the finger tip, and be able to tell just where. He should also be able to distinguish between the touch with a hard substance, as the handle of a brush, a knife, a key ring, and a soft substance, like the tip of the finger.

The examination must be made with the patient blindfolded. The patient should be instructed to signify by the word "no" or in some way, the instant contact is felt; try over and over, and make sure the patient is giving close attention and is doing the best he can.

Then try with some sharp point like a pin or needle, point of scissors or knife, pinching at various points over the body. The patient should be able to recognize the difference, and tell whether you touch with a sharp point or a dull, or a flat surface like the top end of a pencil.

By these tests you learn whether sensation is present, whether it is less or greater than normal, whether the sense conduction is more or less rapid than it should be, whether the patient is able to locate skin sensations, or whether the conducting nerve path, is so interfered with as to prevent, whether the pain sense is more or less acute than normal.

To examine for the sense of heat and cold, one test tube with hot water and another with cold is all-sufficient, by comparison with known healthy persons, a knowledge sufficiently accurate is easily obtained. All parts of the body are not equally susceptible to heat and cold.

To test for deeper sensibilities, blindfold the patient, move the hand, arm, foot, or leg slightly in one direction and another, and have the patient describe how and where.

Have the patient also tell you just the position in which different members lie. In some conditions the patient is unable to tell whether the legs are crossed or lying widely separated.

Disorders of Sensation.—Pain may be psychical, hypochondriacal or hysterical. It may be due to central lesion or to peripheral trouble. It is important that the seat of cause of pain be determined. It must usually be by reasoning from observation and examination. The degree of severity of pain must necessarily be obtained by reasoning from the evidences present. If really severe, there will usually be, motor, vasomotor, or secretory accompanying symptoms that cannot be volitional. Notice carefully, the location, distribution and character.

On account of the arrangement of the sympathetic system, pain from disease of any internal organ is usually felt on the skin in the region supplied by the same part of the spinal cord as the diseased organ.

Hyperesthesia is an increased sensitiveness to touch.

Anesthesia is a loss of sensation to touch; more definitely, it is called tactile anesthesia. Any grade from the most acute sensitiveness to absolute loss of all sensation may be found.

Paresthesia is simply an unnatural sensation,—formication, crawling and the like. The special significance of all these will be noted under the various diseases.

Skin Reflexes.—I shall mention only three although they may be found in all parts of the body. These are of decided diagnostic value, the others as yet are not. Any of the reflexes may be prevented by volition, by a paralysis either of sensation or motion, or by contracture of antagonistic muscles. They may be increased by the presence of a local irritation, or by an irritable condition anywhere in the supplying tract.

The *plantar reflex* is obtained by tickling or pricking the sole of the foot, and is simply a sudden drawing back of the foot; there may be a jerking away of the entire leg. The greater the irritation applied to the sole, the more pronounced will be the jerking. The normal range of difference is quite large.

The *abdominal reflex*, is produced by slight strokes over the sides of the abdomen, with the finger nail, a toothpick or some similar thing, it is simple when a slight contraction of the abdominal muscle may be seen, the main value of this is in case of its long-continued absence on one side, or its presence on one side only. It is very irregular as to its presence and severity in healthy individuals.

The *cremasteric reflexes* are produced by slight strokes over the adductors at the inner part of the thigh which produces a contraction of the cremaster muscle which lifts up the scrotum. It should not be confounded with the scrotal reflex, which is simply a contraction in the skin of the scrotum.

In unilateral diseases of the brain causing hemiplegia these reflexes are lost or very materially lessened. They are absent during unconsciousness either from disease, narcosis or sleep.

Convulsions or Spasms.—Spasms are simply unnatural muscular contractions. They may be tonic, that is an involuntary muscular contraction of long duration, or clonic, a condition in which contraction and relaxation alternate rapidly. The entire body may be affected. It is then termed a general convulsion. A considerable part would be termed partial; if one entire side, a hemi-spasm or convulsion; one member or one muscle or group of muscles only, a mono-spasm. Spasms may be caused by direct or reflex irritation; that is, the irritation may be in the brain, spinal cord, or any of the nerve structures, or it may be in any organ or tissue of the body. A local spasm may be from irritation in a remote part of the body. Pain or excitation in the region of a sensory nerve may produce spasms; these will, however, always be in accord with *Pfluger's* law "that all excitations of sensory nerves affect the motor nerves on the same side of the body and at the same heights." Irritation in the cerebral cortex is the chief source of convulsions. They may be caused entirely by psychic influence, as far as it is possible to determine any disease of the cerebral cortex producing irritation; certain poisons and disturbances of circulation may cause them.

It is probable, however, that by far the most frequent causes are those small lesions in the cortex that we are positively unable to diagnose.

Vasomotor Secretory and Trophic Disorders.—The principal vasomotor center is in the medulla oblongata, although it seems now to be well established that there are centers near the motor centers in the cortex, also in the floor of the fourth ventricle and along the entire length of the spinal cord, probably in the gray matter of the anterior and lateral columns.

The sympathetic, receiving as it does a very large proportion of all the vascular nerves, is a very important factor in vasomotor disturbances.

There are both vasodilator and vasoconstrictor nerves.

As a result of trophic disturbance we may have muscular atrophy; spontaneous fracture of bones and the arthropathies and intermittent joint hydrops; also many skin diseases, the nature of which we do not yet know, the glossy skin, falling out or turning gray of the hair, persistent ulcers and thickening of the nails or becoming brittle.

The nutrition of the skeletal muscles is controlled by the ganglion cells in the anterior horns of the spinal cord. The ganglion cell forms a unit with its process, which is termed a neuron, which goes into the anterior root and through the peripheral nerve into the muscle. Degeneration of the neuron may be entire or partial, depending on whether the cell becomes diseased or its process alone is affected. The muscle degenerates simultaneously with the neuron. As a general rule, then, we are safe in saying that the degeneration of the muscles and spinal neuron is caused by diseases of the spinal cord. Disease in the spinal cord, the sympathetic, the peripheral nerves or the spinal ganglion may produce trophic disturbance in the soft tissue, the skin or the bones.

Little is to be said as to secretion; very little is known. It is probable that there are centers in the anterior horns that govern, in a great measure, perspiration. There can be no doubt that the sympathetic directly or indirectly has a large influence over all secretions.

Examination of the Special Senses.—*Taste.*—This examination is of but little practical value. Bear in mind that the anterior two thirds of the tongue is supplied by a different nerve from that supplying the posterior third and the palato-pharyngeal region. The taste for sour is more acute on the anterior, that for bitter on the posterior portion.

To make the test, write the words (plainly and distinctly on a paper), "salt," "bitter," "sweet," and "sour." Have the patient close the eyes, open the mouth, dip a glass rod in a solution of sugar, and touch it to the tongue, and have the patient open the eyes and point to the written word indicating the taste. Wash the mouth thoroughly, and try in the same way a solution of salt, vinegar and quinine—the quinine always last. It is well to try each side separately. With an unintelligent person these tests are very unsatisfactory.

Smell.—This, too, is of little practical value, and often very unsatisfactory. The result must depend entirely on the patient's statements.

Among the best agents with which to make this test are the oils of lavender, cloves, turpentine and peppermint. They have each a distinct, easily recognized odor, and they do not stimulate the sensory nerves of the mucous membrane.

Close one nostril and hold the oil to the other, and get the patient to describe the odor or tell what it is. Try first one side and then the other. You will, of course, have patients who are not sufficiently familiar with any of these substances to recognize them by the odor. In those cases endeavor to find some non-irritating substance, with the odor of which he is familiar.

Loss of smell may be due to local disease destroying the nerve endings, or to central lesion, fracture at base of skull, cerebral tumor, etc.

Hearing.— This examination is important, and should always be made. Every physician should test his own watch with a large number of normal ears, so as to learn at what distance from an ear its ticking should be heard. Have the patient close the eyes, place the watch close to one ear, and move it slowly away in a straight line from the side of head until the patient can no longer hear the ticking, measure the distance, and compare with the normal distance of your watch. To test for bone conduction close the meatus, and then apply your watch if it is a loud ticker, if not, a tuning fork against various parts of the skull. If the sound can not be heard or is very indistinct, the bone conduction of sound is deficient. To differentiate between mechanical loss of hearing, place a tuning fork on any part of the skull; when the sound has ceased to the patient, bring it near and opposite to the ear; if there is a mechanical loss, the sound will not be heard. If normal, or if there is a loss from nerve, the sound will be heard. If there is a total loss of hearing, of course the sound will not be heard in either case. The sound of the tuning fork placed on the frontal bone will be heard in both ears normally. By closing one meatus the sound will be in that ear. If there be a disease of the ear interfering with the sound-conducting apparatus, it will be heard in the diseased ear, while in nerve impairment it is heard in the sound ear.

The Sight.— The eyes should always be examined. While it is not essential or expected that the general practitioner should be an expert on the eye, it is imperative that he be able to determine whether the eyes are normal as to vision and as to their muscles. It is not at all uncommon to have a patient that has been suffering for months or years without the slightest suspicion of any defect in the eye, and have the examination reveal the fact that the entire trouble is in the eye. It is not the most pronounced or gross defects that usually cause nervous

disorders, but the minor defects. A slight myopia or hyperopia or a slight muscular weakness are much more likely to cause those things which result from eye strain. The patient accommodates himself to the greater defects; they are discovered and corrected before damage is done. The patient will use one or the other eye, and not make an effort to concentrate both on an object at the same time. Astigmatism is a condition often overlooked, and yet it is capable of producing a very severe eye strain.

To test for simple myopia or hyperopia use the test types, have them hung where a bright light will strike them, and about on a level with the patient's eyes. Have him sit with back to the light twenty feet from the card. Have the patient read aloud the letters and figures, commencing at the largest until a line is found that cannot be read distinctly, that he can not see with perfect clearness and distinctness. The smallest line that he can read thus is the limit of vision; you indicate what that is by means of a fraction, taking the figures indicating that line for the denominator, and the distance 20 feet for the numerator. Thus if the patient at 20 feet can read clearly and distinctly the line indicated by 20, his vision is $\frac{20}{20}$, or normal. If he can only read the line indicated by 40, his vision is $\frac{20}{40}$, and he is myopic or nearsighted. If he can read the smallest line indicated by 10, his vision is $\frac{20}{10}$, that is, he is hyperopic or longsighted. This test should be made with both eyes, and also with each eye, the other eye being covered. You will not infrequently discover that both eyes are not alike. If there is a great difference, the patient probably unconsciously has learned to use only one eye at a time for objects out of the range of the other. If only a slight difference exists, he is constantly trying to force both eyes together, and must suffer from eye strain. The tests with the ophthalmoscope I will not undertake to give here. A physician having an ophthalmoscope and knowing how to use it, will have text-books from which he can get all the information needed.

A test of the field of vision is also of great importance. This can be done by a very simple process. Have the patient sit with back to the light, cover one eye, hold one finger directly in front of and on a level with the open eye. Fasten a small square of white paper on the end of a penholder or lead pencil. With this in the other hand off to one side, where the patient can not see it, gradually move it toward the other till the patient is able to see the white paper, have the patient indicate in some way the instant he first sees it. This gives the range of vision laterally. By approaching the common center from every direction, the range of vision in all directions can be measured quite accurately. Watch carefully to see that the patient keeps the eye

directly on your finger. For the inner range note that the nose cuts off the field at its angle. In this way test each eye separately.

In the same manner use a blue, then a red and then a green square of paper. The field is not as great for these colors as for the white. It lessens in the order I have named the colors.

Any of the muscles of the eyeball may be paralyzed, contracted or weak. As in other defects it is usually the lesser that cause nervous disorders. Muscular defects may be the direct results of disease in the nervous system, notably the brain, or may cause certain nervous disorders, as neurasthenia, hysteria, epileptoid, insanity and like conditions. Some authorities maintain that nearly all non-traumatic epilepsies are the result of muscular defects in the eye. While I can not quite agree, I am sure that many epileptics are and can be cured by simply correcting the defects in the eyes either by operation or by the use of glasses.

The relative strength of the various muscles can be tested sufficiently to determine that they are not fully normal, by having the patient follow the finger with the eyes in every possible direction, as far as possible and noticing whether the eye can be held in the extreme position, steadily and without trembling, whether both eyes move in absolute harmony and whether at any unnatural point there is a defect or a double vision. The finger or a pencil may be held directly in front of the patient four or five feet from the face, the patient directed to keep both eyes steadily upon it, gradually move it nearer the face at level or slightly only above level of the eyes; note just whether the patient at any point sees double, and also whether as it gets close, so that the eyes must converge in order to see it, one or the other rolls out or back to a center, or whether there is tremor of the ball when held forcibly in this position. If the vision becomes double, one ball rolls out or there is marked tremor in the effort, there is a muscular defect that requires the attention of an oculist. The examination of the inner muscles or more commonly speaking the pupillary action is often of great importance. Normally the pupils will contract at once on the admission of a bright light; this may be tested by having the patient in any position where a bright light can shine into the eyes, and covering an eye for a few seconds then uncovering it and watch the pupil, or especially if the patient is unconscious, a burning match or candle can be brought close to the eye, the action of the pupil being watched closely. They should contract.

The pupils contract normally also when the eyes are converged or when looking at objects quite near. As a rule, when one pupil contracts, the other does also; that is, normally both pupils contract or dilate together. If the patient has naturally a very small pupil, it will

require very careful inspection to come to any determination at all satisfactory.

Inequality of the pupils, if at all well marked, is always evidence of disease.

I. DISEASES OF THE BRAIN AND ITS MEMBRANES.

EXTERNAL PACHYMEMINGITIS.

Inflammation of the Dura Mater. — This disease practically never occurs except following some bone disease, as caries, or lues, erysipelas, etc. There is no distinct symptomatology or treatment.

Hemorrhagic Internal Pachymeningitis, or Hematoma of the Dura Mater is of more interest to the pathologist than to the practitioner.

It occurs often as a result in phthisis, chronic heart or kidney trouble. It may be caused by injury to the cranium, pernicious anemia, scurvy, leukemia, chronic alcoholism, chronic hereditary chorea, senile dementia or dementia paralytica.

Symptoms. — There will usually be a stage of excitement, with great restlessness, there may have preceded or appeared with this stage very severe headaches, vomiting and muscular twitching of one side. This is followed by a long-lasting, more or less profound coma. The pulse is slow and irregular, often quite full.

The temperature at times may be subnormal, the general tendency being for a gradual but irregular rise to 105° or 106° .

The course is apt to be quite irregular, with many distinct and marked remissions and aggravations. Paralysis may be present, but is not at all uniform.

Diagnosis. — There is not the stiffness of the neck, and there is more evidence of the basal cranium nerves being affected, than we get in simple meningitis. It cannot be differentiated often from cerebral hemorrhage. The chief diagnostic sign must be the presence of some one of the causes and the irregularity of the paralytic symptoms with intercurrent convulsions.

The *prognosis* is grave.

Treatment. — None, except for the concomitant trouble, and such as would be indicated for a meningitis or cerebral hemorrhage.

Traumatic Hematoma. — *Intra- or extradural hemorrhage of traumatic origin.* — It is not essential that there be a fracture of the bones. If of the middle meningeal artery the hemorrhage will be

between the dura and the skull; if beneath the dura, it is usually from veins in the pia mater.

Symptoms.—After an injury, the patient becomes unconscious or is dazed, wakens, is bright for an hour or two, then becomes somnolent, gradually deepening into a profound coma. The pulse is slow and tense. The temperature may be slightly subnormal, but is more frequently normal until near the end, when it is likely to rise rapidly. There will be signs of motor irritation and a more or less unilateral paralysis. There may be hemorrhages on both sides, and, as a consequence, paralysis on both sides. There may be areas of anesthesia, but these are not at all common. Speech is usually interfered with. The pupil on the affected side is usually dilated; there will usually be a choked disk on the same side.

Treatment.—Remove the clot if possible. Very few cases recover without. The external injury when present will determine the location. If there is no external injury there are in a very large proportion of the cases sufficient localizing symptoms. In the few cases where it is impossible to judge where to operate, keep the patient quiet, apply cool to the head, not ice; give arnica (3x) every half hour.

SIMPLE CEREBRAL MENINGITIS.

Synonyms.—Acute Cerebral Meningitis and Lepto-meningitis.

Definition.—Acute inflammation of the membranes of the brain. This disease may affect the base, when it may be termed basilar, or the vertex or forepart, when it may be termed vertical. It, however, usually affects both. The cortical substance of the brain is often implicated.

Etiology.—Many cases occur without discoverable cause. Many times it is seemingly the result of exposure to cold or great heat. There are times when this disease seems to be very nearly an epidemic. It frequently follows ear diseases and all those conditions in which there is a formation of pus in any part of the body. It may be due to injuries to the skull, other than those mentioned under traumatic meningitis. It is probably always the result of infection; the micro-organisms pass through the blood vessels or the lymph paths either from general infection or more or less distant foci of infection.

Pathology.—There is first hyperemia of the pia mater, followed by a cloudy appearance and small collections of pus which coalesce till the entire membrane is covered with a thick layer of greenish-yellow pus. The cortex may become infected and small pus collections found at various points, and in some cases followed by small areas of soften-

ing. Serous exudation may occur into the brain substance and into the ventricles to the extent of a genuine hydrocephalus.

Symptoms.—The onset may be sudden or gradual. There may be a distinct chill, accompanied with vomiting and decided fever. When occurring as a result of some other disease the symptoms so merge with each other as to make it extremely difficult at times to form any idea of the beginning till the disease is quite well advanced. The presence of severe head symptoms entirely out of proportion to the original disease, the sensitiveness to light and sound, together with the appearance of vomiting will indicate its presence. In the gradual onset there is first general malaise, followed very soon by severe and persistent headache, the location depending on the part most affected, sometimes general, most frequently at the basilar or frontal, possibly there may be vomiting without much, if any, nausea, followed in a day or two by mental dullness; a dazed feeling, delirium during sleep, then possibly while awake also, a tendency to somnolence, and often an alternation of delirium and somnolence. There is marked sensitiveness to light or noise, the headache evidently persists during delirium, somnolence and even quite profound coma. There are signs of pain if the nurse attempts to move the head. This arises partly from hyperesthesia and partly from the almost uniformly constant rigidity of the muscles in the back of the neck which often retract the head markedly, causing that prominent symptom, “boring the head into the pillow.” There will usually be more or less rigidity of all the muscles of the body. This is only detected by trying to make passive motions of different members and finding an abnormal resistance. The abdomen is often retracted so as to be saucer-like on account of rigidity of abdominal muscles; later there is likely to be evidence of paralysis of one or another part, a convulsion or series of convulsions, deep coma, and a period of threatened collapse; in a very large number of even fatal cases, there is a decided amelioration of all symptoms for a few hours or a day, followed by pronounced coma, collapse and death or a gradual improvement.

The temperature gradually but somewhat irregularly rises to 104° or 105° F. It may in this disease go as high as 108° F., and recovery take place. At any time a very rapid rise or fall of temperature portends danger. It may become subnormal instead of very high previous to death.

The pulse early is likely to be rapid, full, and hard; that is, too rapid, full and hard to correspond with the temperature. This, however, is not always the case. It usually keeps pace with the temperature. If

at any time there is a marked divergence between the pulse and temperature either way, there is serious danger.

The pupils are at first contracted, later dilated, are apt to be somewhat variable, even at times, not alike in both eyes, later the pupillary reaction is often absent, occasionally there will be nystagmus (continuous rapid oscillation of the eyeball) and paralysis of one or more of the eye muscles; strabismus may occur.

There is usually constipation; there may be retention of the urine, or it may be passed involuntarily.

Bear in mind that the symptoms must necessarily differ very greatly in different cases, owing to the seat of the lesion, the extent and special character. I have tried to give the most frequent picture.

Prognosis.—This is always grave, but it is one of the few diseases in which the patient may recover as by a miracle. All the evidences of approaching dissolution may be present and the patient recover. No physician has a right to give up, and stop making his very best fight as long as there is any life present. With children, it occasionally destroys sufficient brain areas, or arrests development to an extent to cause them to be more or less feeble-minded. It at times leaves distinct small foci in the cortex, that cause epilepsy later. It is quite probable, in fact almost certain, that there are many severe cases in which there is serous effusion, and no pus; these are the cases that recover, while those in which there is a purulent exudate usually terminate fatally, but not always.

Differential Diagnosis.—*From delirium tremens*, by the history, the higher temperature, the absence of other alcoholic symptoms, such as tremor of hands, etc. In delirium tremens the characteristic headache is not present.

From uremia by analysis of twenty-four hours' urine.

From typhoid fever by the "rosy spots," the range of temperature and abdominal palpation.

From pneumonia by examination of the chest.

Treatment.—Perfect quiet in bed with head somewhat elevated. Be sure the clothing is loose about the neck, and that the neck is not bent at an angle. No noise and very little light should be allowed in the room. No excitement.

Cold applications may be made to the head, in strong adults even an ice-bag. The ice-bag to the head should never be used with young children. General tepid sponge baths may benefit.

Pus should be looked for carefully and wherever found should be removed at once. If there is any evidence of ear trouble, a com-

petent specialist should determine early the advisability of mastoid puncture or other surgical procedure.

In cases where pressure is very severe, it may be advisable to draw a small quantity of the cerebro-spinal fluid by lumbar puncture. If this is done, I would advise careful bacteriological examination for various micro-organisms.

Little children suffering from this disease should never under any circumstances be rocked or carried about.

The bowel movements should be watched carefully and free movements daily obtained.

The urine should be measured every day for the quantity passed in twenty-four hours, and means employed to keep it up to full normal.

In those cases occurring without known cause, if there is a rapid, full, hard pulse, veratrum viride tincture in from three- to five-drop doses should be given every twenty minutes, the physician sitting by the bed and keeping his finger on the pulse, until the pulse is soft and about fifty. I am quite certain that many cases have been prevented from developing by adopting this treatment early. Neither have I ever seen any bad results follow.

If the pulse is rapid but soft, Gelsemium tincture and Cimicifuga tincture in three-drop doses in children and five drops to adults, alternating from half an hour to an hour apart.

For the stage of collapse, use hot pack, stimulation with aromatic spirits of ammonia, quinia bromide in from one-half to two-grain doses every half hour to every hour; and if extreme, an intravenous injection of normal salt solution should be given. In small children colon enemas of normal salt solution or the subcutaneous injection of the latter may be employed.

Aconite (3x). — Pulse rather hard, a quick beat not very rapid, or even slow, mental dullness alternating delirium and somnolence, timidity, burning headache, furious headache, headache worse during motion or drinking, bending head far back, external head hot, restless, yet motion increases the pain.

Belladonna (3x). — Violent delirium, very talkative, restless, eyes bright and shining, face red, changing from gay to fury, tries to bite, strike or spit. Coma with pale face. Coma alternating with convulsions, throbbing of the carotids.

Stramonium (3x). — In these cases Stramonium has the same general condition as belladonna, except that the delirium is more furious, not alternating, there is an ugly look on the face, a small but frequent pulse, tetanic stiffness of muscles, face rather inclined to bluish

with the stertor, convulsions brought on by slightest touch, sighing inspiration, tremor of the tongue and limbs.

Hyoscyamus.—I always use a trituration made from Mercks' Hyoscyamine Hydrobromate. I prefer in these cases the 4x, giving a 2-grain powder once in from two to four hours; pale face, cold extremities, tries to get out of bed, an impulse to run away. Delirium more like an insanity, convulsions excited by drinking, pleasant expression on face during coma.

Opium (1x trit). — Pupils markedly contracted, somnolence from which can be roused, very profound coma, stertorous breathing.

Helleborous niger (2x) is always to be used when there are signs of effusion with a tendency to scanty urine. Even in the very early stages where there is simply the profound headache, if there is a tendency to scanty urine, this remedy will often do wonders. It is a remedy that should in every case be considered carefully.

Cuprum Acet. (6x trit.) for the vomiting and in those cases showing marked tendency to muscular spasm.

Camphor mono bromate (1x trit.) during the stage of collapse.

In the cases in which there is a probable purulent element, the treatment must be directed toward it, *Silicia* (30x), *Hepar sulph.* (4x), *Merc. iod.* (3x) being the chief remedies.

CHRONIC MENINGITIS.

This inflammation may follow a subacute or even an acute leptomeningitis. It is most frequently the result of alcoholism or syphilis. Very little is known of it. A persistent headache with a tendency to persistent stiffness of the muscles of the neck, some mental cloudiness, increased sensitiveness to light and sound with possibly a partly choked disk, without other phenomena to account for them, would lead one to suspect this disease. In some of the syphilitic cases the symptoms are sufficiently pronounced to render a diagnosis reasonably certain. We rarely, if ever, except in the alcoholic or syphilitic cases know of it except upon the post-mortem table.

The treatment is to be directed to the alcoholism or syphilis as the case indicates.

CIRCULATORY DISORDERS OF THE BRAIN.

Cerebral Anemia.

Any cause that prevents a flow of blood to the brain, or that causes an emptying of the blood vessels of the brain, may produce anemia.

The anemia may be acute or chronic. It may be a sudden and transitory anemia or it may be gradual and prolonged. It may be most pronounced at the onset, or it may gradually increase for weeks and months.

Anemia of the brain may also be the result of a poor quality of blood supply. It may occur in the course of other diseases, or be apparently idiopathic.

The rapid loss of a large amount of blood in any way; the removal of ascites or of a large tumor of any kind from the abdominal cavity, a long-continued excessive loss of blood from any source, and vacuum treatment, may any of them cause acute anemia. It is often purely vasomotor from emotional disturbances; these cases are known as simply fainting, and are nearly always very transitory.

Diseases of the heart causing a low blood pressure, aneurysms of the vessels leading to the brain, pressure of clothing or tumors on vessels supplying the brain may be a cause.

Anything that vitiates the quality of the blood so as to render it low in nutritive elements may produce it.

Symptoms. — If *acute*, there is a weakness accompanied with loss of vision, buzzing in the ears, nausea and sometimes vomiting, vertigo, loss of consciousness more or less complete, usually paleness of face and mucous membranes of the mouth and lips, or a tendency to sleep and a sense of general apathy. Occasionally general convulsions occur. The attack may last a very few minutes or some hours. There may be repeated severe attacks of more or less complete loss of consciousness, with simple general apathy and drowsiness between.

If *chronic*, there is a headache, not characteristic, however, vertigo, drowsiness, apathy, roaring or buzzing or singing in the ears, weakness of memory, general mentality somewhat weakened, inability to concentrate the mind or to hold it steadily on any given subject, rarely hallucinations or delusions, insomnia occurs very often notwithstanding the drowsiness, and there is often a tendency to faint on slight provocation.

Prognosis, usually good, must however depend somewhat on the possibility of removal of the cause.

Treatment. — *Acute.* — Remove all tight clothing, lay the patient flat, may even be advisable to elevate the hips, or to allow the head to hang down, in some cases the whole body should be elevated, the head hanging down, being careful not to bend the neck. It may be advisable to bandage the legs tightly from toes to hips, sprinkle cold water on the skin, rub the arms and legs briskly. Hold stimulating substances such as ammonia, camphor, or amyl-nitrite under the nose. Administer heart stimulants hypodermatically. In severe and prolonged

cases intravenous transfusion of the normal salt solution should be done. Dilation of the sphincter ani will sometimes do wonders. The immediate attack being over, direct treatment to the cause if still existing.

Chronic. — The first element in the treatment is to discover the cause. A blood analysis should always be made if possible. The cause having been determined, the treatment must be directed to its removal or amelioration. Aside from this the treatment for general anemia.

HYPEREMIA OF THE BRAIN.

This condition may be *active*, a too great quantity of arterial blood or *passive*, a too great quantity of venous blood within the cranial cavity.

There is some doubt as to the brain ever having too great a quantity of arterial blood except for a short time. There are people with a weak vasomotor control, in whom such slight causes will produce it, that it can almost be considered as continuous.

Emotional disturbances, overeating, especially when excited or fatigued, alcoholic drinks, plunging in cold water, excessive heart action and certain drugs are among the most common causes. Attacks may occur in the course of hysteria or neurasthenia.

There will be throbbing, pulsating headache, with a bright red, hot face, the throbbing will be felt all through the head, blurring of the vision, a dazed sensation, the pupils contracted, the pulse hard and tense, may be slow or rapid, and some aphasia. It is not at all usual but some cases become apoleptic, with very profound coma, and even death results, but this is rare, the prognosis usually being good except in cases where there are diseased blood vessels, and consequent danger of rupture and hemorrhage occurring.

The passive hyperemia may be caused by anything that retards the flow of blood from the brain, by certain heart and lung conditions, straining, long, close mental application and worry. These cases are quite apt to be hard to control, recovery depending largely on the cause.

There are very few symptoms that can be considered as at all diagnostic, yet a very wide range of symptoms are presented. There may be an excessive tendency to sleep or a very pronounced insomnia, the headache will be dull, heavy, often a sensation as if the upper part were so heavy it would crush the lower part; it is aggravated by motion, coughing and the like, and often in the recumbent position there is apt to be a general confusion of the mind. These cases may become somnolent or even comatose, and death result, but not commonly.

Treatment. — For the tendency to active hyperemia, the patient must avoid excitement, very active exercise and too hearty meals. Should drink no tea, coffee, or alcoholic liquors, and eat very moderately of meats, the main diet being vegetables and the like. A cold sponge either on rising or retiring, massage, the static glow, central galvanism, regular daily physical exercise of a character that will include every part of the body, not violent, but sufficient to produce slight muscular fatigue. It is of great importance in these cases, that this exercise be accompanied with good, full, regular, breathing exercises.

In every case a full quantitative analysis of the 24 hours' urine should be made, to ascertain first whether there may be a kidney trouble, a uremic poisoning, and the character of the nutrition of the patient. During the immediate attack, an upright or semirecumbent position, cold applications to the head, hot applications, even mustard paste to the extremities. General faradization of the trunk and extremities. In very severe cases venesection may be essential. The chief remedies for the tendency to active hyperemia are Aconite (30.) Duboisine (4x), Glonoin (30x), Belladonna (30x), Veratrum viride (3x), Gelsemium (30x), Ferrum phos. (6x). The indications for these remedies are so well known that they need not be repeated here.

The treatment for the passive form must first of all be directed to the cause, whatever it may be. In this form a moderate life in every particular should be advised. In the cases resulting from obstruction unless it can be removed, simple palliation is all that can be obtained.

In the cases resulting from no apparent present cause, or from grief, worry, too close application, sunstroke and like causes, advise moderate, regular physical exercise with full breathing exercises, cold sponge baths, or carefully administered hot baths, massage, general faradism, and galvanism. Apply the galvanism to the brain, from 2 to 3 milliamperes or from 4 to 6 cells of bichromate battery; the negative at base of brain, the positive at root of nose, and over each eye, for about five minutes, then pass the current transversely, one pole just back of each ear, alternate the direction about every thirty seconds, for about three minutes.

The chief remedies in this class of cases are aconite (2x), Camphor mono brom. (1x trit.), Glonoin (3x), Cimicifuga (Tincture), Gelsemium (Tincture), Nux vomica (3x), Zinc phosphide (1x to 3x trit.), Ammonium mur. (2x), Aurum et Sodium chloride (3x), and Sulphur (30. trit.).

THE APOPLEXIES.

While apoplexy is not and can not be the proper name for any disease, it has, by use, been established in our nomenclature and has

a fairly well defined significance, and is used to define a condition characterized by sudden paralysis, with or without loss of consciousness, resulting from the bursting or blocking up of a blood vessel.

It may be cerebral or spinal, but far more frequently it is cerebral, in fact, when the simple term apoplexy is used, it is by common consent considered to be cerebral.

Three principal forms may be described, the hemorrhagic, embolic, and thrombic.

Cerebral Hemorrhage.

Cerebral hemorrhage is a rupture of a blood vessel within the cranial cavity. It is convenient to consider it under four separate heads, corresponding to the four groups of blood vessels in the brain. Under the head of cerebral hemorrhages will be considered ruptures of those blood vessels supplying the internal capsule, the white matter, and the basal ganglia, a very large percentage of all the cases occur in this group of vessels. We have also the pachymeningeal, the subarachnoidal groups, and the groups chiefly supplying the pons, medulla and cerebellum.

Central Hemorrhages.

Etiology.— May occur at any age, but after early infancy is quite rare till forty, except in syphilis; from this time on, the predisposition increases rapidly to eighty, when it materially diminishes. The influence of hereditary predisposition to arterial disease is undoubted. The so-called apoplectic habit or build I believe to be a myth. A narrow thoracic artery or weakness in the walls of the blood vessels, whether inherited or acquired, predisposes.

The diseases predisposing to cerebral hemorrhages are infectious fevers, marasmic states, chronic kidney disease, rheumatism, gout, syphilis, chronic alcoholism, scurvy, purpura and leucocythemia.

As direct causes we have any physical exertion, such as straining at stool, lifting beyond the strength, running, very rapid walking, etc., marked excitement of any kind, eating a very large meal or drinking large quantities of fluid, taking a cold or too hot a bath, in short, anything that will materially increase the blood pressure in the cerebral vessels.

The diseases that may be considered direct causes are various forms of heart disease (quite notably fatty), arteritis, miliary aneurysms and atheromatous arteries. It is a question whether some of the kidney diseases should not be placed in this list.

Symptoms.— There are practically no prodromal symptoms, it is

a fact that occasionally, especially in syphilitic cases, there is for a time occasional attacks of mental confusion, vertigo, formication, in one arm or leg or both arm and leg, pain in the head or a full feeling; but all these so frequently occur without being followed by an attack of this kind, and on the other hand these attacks so frequently occur without any of them, that they can hardly be considered as prodromal of cerebral hemorrhage.

The attack is always sudden, there may be convulsions with coma or simply coma, occasionally no coma is present.

The most frequent form of onset is, the patient suddenly, without warning, becomes unconscious, the face is flushed, rather tending to dark bluish or purple, the eyeballs are fixed and turned to one side or they may be perfectly straight.

The pupils are contracted, and do not respond to the light, eyes partly closed, breathing stertorous and labored, one cheek puffing out with each expiration. The pulse is hard and rather slow. The whole body is bathed in perspiration. The limbs are relaxed, but close inspection will usually show some signs of paralysis in an arm or leg, or the arm and leg of one side. The urine and feces may be discharged involuntarily or may be retained. The temperature at the onset will usually be normal or below. If below $97\frac{2}{8}^{\circ}$, it is a serious case. In a few hours the temperature will be somewhat higher on the paralyzed than on the sound side. The continuance of coma, especially with increase in pulse rate and elevation of temperature, is unfavorable. Swallowing and speech are difficult or impossible. The appearance of the Cheyne-Stokes respiration, or hypostatic pneumonia, portends a rapidly fatal termination.

The rapid cases usually die in from two to four days. The less rapid but fatal cases may remain in coma for a good many days, or partially recover and then lapse with a stupor and low delirium.

In these cases the temperature may remain normal for two or three weeks even; and then begin to rise; the rise in temperature is always an indication of serious portent. Separation of temperature and pulse is a sign of danger.

In the cases that recover there is a wide range in the length of the coma. It may last only five or six hours or it may last a week or even more, still every hour of continuous coma after the first twelve hours renders the prognosis less favorable.

The temperature in these cases remains about normal all through the coma, except slight fluctuations due to immediate collateral causes. There may be occasionally quite a sharp rise in the temperature for a short time even in the favorable cases. The coma disappears gradually.

and may leave the patient with a perfectly clear or weak and confused mind, and the speech somewhat disturbed. In right-sided hemiplegia there is frequently motor aphasia, an entire inability to either use or understand language. The pupil on the paralyzed side is more contracted than on the sound side, and there may be an incomplete paralysis; these disappear, however, with returning consciousness.

The specially marked symptom in the hemiplegia or paralysis of one side is that the arm and leg are more markedly affected than the face. Only the two lower branches of the fifth nerve are implicated, therefore the patient can close the eyes. The tongue, when protruded, turns toward the paralyzed side. The paralyzed muscles are flaccid, but later on some of them become quite rigid and contracted. In a few cases rigidity sets in very early. The tendon reflexes may be lost or partially so. The cutaneous reflexes are much lessened on the affected side, or may be abolished.

The Chronic Stage.—When the symptoms of cerebral irritation and shock have disappeared, which is usually in from three to six weeks, that which is termed the chronic stage begins.

There has been marked improvement usually in the paralysis, and the sensory symptoms have nearly or entirely disappeared. Improvement continues, but more and more slowly, and may continue a year or more.

The facial muscles are less affected by this paralysis than the arm or leg. In most cases, there is very little if any paralysis of the muscles of phonation, facial expression or respiration.

In quite a large percentage of the cases the muscles of the bladder and rectum are somewhat affected.

The superficial reflexes are now present, and the tendon reflexes are exaggerated. There is now almost universally an increasing rigidity of the paralyzed muscles and a later marked contracture of the extensors, especially of the extensors of the foot and hand. There is no true atrophy of the paralyzed muscles, simply such loss of development as comes from non-use. There may occur spastic movements in the paralyzed limbs.

Anesthesia is not common and is slight when present at all, and confined to small zones in the feet and hands. Paresthesias of various kinds are quite common, and a peculiar, persistent, burning sensation is not at all uncommon. This symptom is exceedingly annoying.

Increased growth of hair of the paralyzed part is quite common.

Electrical reaction is very little affected. The patient is apt to be irritable and emotional, and often there is a more or less marked loss of the power of fixing the attention on any subject. Occasionally

epilepsy or insanity ensues, particularly, if speech has been or is materially affected.

Meningeal Hemorrhage.

The hemorrhage may be extradural, where the clot is between the dura and the skull, or intradural, the clot being in the crenoid space, or it may be pial.

Dural hemorrhage may be idiopathic, but this is quite rare. It is usually the result of traumatism, alcoholism, syphilis, or occurs in conjunction with insanity.

The rupture is usually in the middle meningeal artery or vein or branches.

In the dural hemorrhages resulting from traumatism, a grave error in the management is frequently made at the time or immediately following the injury.

Anyone past the meridian of life when he receives any blow on the head, should be kept perfectly quiet for a time, and be very cautious as to excitement or exercise for one or two months.

There may be unconsciousness at once, but as frequently, if not more so, unconsciousness does not appear until from 3 hours to 2 months after the injury. The patient becomes first dull, then somnolent, and finally sinks into a deep sleep; with unconsciousness. Whenever it appears, there is a hemiplegia on the side of the body opposite to that on which the clot is located. There is occasionally stertorous breathing, and in the most cases the Cheyne-Stokes respiration develops. The pupils are unevenly contracted, that on the paralyzed side being contracted the most; they do not respond to light. Both eyes and also the head is turned toward the paralyzed side and opposite that in which the lesion is located. Sometimes the pupil on the side of the lesion is dilated, and the opposite pupil is quite small; this is known as the "Hutchinson pupil," and indicates a severe brain pressure, the third nerve being compressed at the base. In a large number of the cases there will be spasmodic movements, consisting of irregular twitching of the facial muscles and eyes, and sometimes of the entire affected side. There may be considerable rigidity. The reflexes are usually exaggerated.

The temperature is frequently one or two degrees above normal, but often just normal.

The skull should always be opened and the clot removed. Unless this is done, practically all the cases grow steadily worse, the respiration becoming feeble, the pulse rapid, and death ensues. The chances of complete recovery from operative interference are good.

The cases occurring in insanity or from alcoholism are from rupture of the middle meningeal artery or branches, or rupture of the veins of the pia mater ; small and repeated dural hemorrhages are quite common in the course of general paresis.

The symptoms are so masked by the alcoholism or insanity present that no single description is of any value. There will be vertigo and headaches more or less frequent and of varying degree followed by a sudden coma, with marked signs of hemiplegia, and often quite marked anesthesia, with, in some cases, spasmodic movements of the paralyzed limbs.

Pial Hemorrhage

As a rule this cannot be diagnosticated. There will be the sudden coma, and rather more marked spasmodic movement in the paralyzed members, if the lesion is in the motor area. The hemiplegia is usually incomplete, often simply a monoplegia.

Pons Hemorrhage

Is nearly always fatal; there is unconsciousness at the onset. The pupils are contracted to pin heads, twitching and jerking of muscles of both sides, and some rigidity on both sides. The muscles of the face and eyes are involved. Deglutition is interfered with as also is speech and articulation. Temperature is always elevated from four to five degrees.

Cerebellar Hemorrhage

Is usually fatal. There may be a sudden onset, or there may be some hours or a day of severe headache, usually occipital. The motor symptoms are not well marked; it is frequently difficult to determine any paralysis; if there be any present, it will be on the same side as the lesion. Respiration is more uniformly and markedly affected than in any of the other forms. The pulse and circulation generally is the same as in the other forms.

Embolic Apoplexy.

An embol is a substance, such as fat, fibrin or a blood clot that is carried in the blood current through the blood vessels. Embolic apoplexy is the plugging up of a blood vessel in the brain by an embol. It is not very common after fifty years of age, but does occasionally occur even in quite old people. The embol most frequently lodges in the middle cerebral artery or its branches.

Etiology.—Inflammatory rheumatism, endocarditis from any cause, anemia, infectious fevers, blood dyscrasias, fatty kidney or heart,

hemorrhoids, uterine conditions and varicose veins are the chief factors in the causation.

Symptoms.— A sudden coma more or less profound usually ushers in the attack; this is usually of short duration. In a fair number of cases the first indication is the hemiplegia without any loss of consciousness. A marked convulsion or simply convulsive twitchings are nearly always present at the onset. There is usually no vomiting. The pulse is nearly normal, not hard, full, bounding or very slow. There is very slight change in the temperature at first, but after a few days there is likely to be some rise, but not more than one or two degrees, except in very severe cases. The breathing is usually not stertorous; the face is flushed.

The hemiplegia begins to subside in a few days, unless a large area of the brain is cut off from its blood supply, and continues to improve with considerable rapidity. Not infrequently there is practically a complete cure in a few months. The mind is not usually materially affected except for a very short time. If softening supervenes, it may be so acute that death occurs within 48 hours, but usually not for several weeks. We then have the usual symptoms and course of cerebral softening.

The chronic hemiplegia is of the same character as that of hemorrhage.

Thrombic Apoplexy.

Thrombosis is a plugging up of a cerebral blood vessel from disease of the vessel at the point of stoppage. It may affect any of the cerebral vessels.

Etiology.— Endarteritis from gout, lead, or syphilis are the most prominent causes. Fatty heart and blood dyscrasias come next. Any diseased condition of the blood vessels may result in thrombus. It may occur earlier, but is most common after the fiftieth year.

Symptoms.— Premonitory symptoms are common, and often exist for some months previous to the attack. There is likely to be numbness of one side of the body or of one arm or leg, or it may be confined to small areas, recurring more or less frequently and of variable duration; or there may be recurring and transitory attacks of slight hemiplegia or monoplegia or paralysis of facial muscles. There may be transient attacks of aphasia, or of drowsiness. The onset is nearly always gradual, the hemiplegia, and coma becoming more and more pronounced for several hours. The onset may be sudden, but in only a small number of cases. Very soon except in the most severe cases there is a comparatively rapid improvement in the hemiplegia, which, unless extensive softening takes place, or there is extensive disease of

the arteries, continues more rapidly than in hemorrhage and less so than in embolism. The other symptoms closely resemble those of hemorrhage. The most frequent seat of softening from either embol or thrombus is in the region of the vertebral, basilar and middle cerebral arteries.

Serous Apoplexy.

I retain this term notwithstanding the fact that neurologists in their writings have almost unanimously discarded it.

There is no doubt that a serous exudation may occur in the brain just as under like conditions it occurs in other parts of the body. When this serous exudation is rapid and in considerable quantity it does produce a serious and not infrequently a fatal coma.

Etiology.— It usually occurs in people in the later years of life who are debilitated by asthenia. Suppression of urine with uremic poisoning, are frequent causes; anything that will materially retard the flow of blood through the cerebral veins; various heart affections; the prolonged use of opium, cocaine, choral or alcohol are frequent causes.

Symptoms.— There is usually a general lethargy, a tendency to unnatural drowsiness, more or less formication in various parts of the body, some difficulty in fixing the attention, difficulty in forming sentences, and marked tendency to forget common words suddenly during a conversation. The patient will sometimes be apparently listening to a conversation and believe he is listening, when all at once he will discover that he has not heard or comprehended a considerable part of what has been said. This will be followed by a muttering delirium and hallucinations of sight and hearing. There will be consciousness sufficient to enable the patient to partake of food. The temperature normal or at most raised a half degree, the pulse rather rapid, and not large or full. The skin is hyperesthetic. The arms and legs become stiffened and the head somewhat retracted; the pupils are small, and do not react to the light well. The tongue is apt to be heavily coated and dry. The arms and legs are stiff and cold, and the pulse now becomes rapid and feeble, followed by a profound coma and death, possibly with pneumonia as an immediate cause. The various stages may each be days in duration. In a good many cases from three to five weeks elapse between the first prominent symptoms and this fatal coma. In some cases a profound coma appears as almost the first indication. There has preceded it simply a slowness of mental activity and a tendency to drowsiness and possibly more or less numbness of various parts.

There are many cases, too, in which the profound coma does not appear at all, but the patient lingers along gradually clearing up the

mental and then the physical symptoms, and makes a more or less complete recovery.

Pathology. — In spontaneous intracranial hemorrhage we always find diseased blood vessels in the brain. There may be a degenerative arteritis affecting only the smaller arteries, mainly of the cerebral groups. An area of the internal coat is first affected by the degeneration which causes local weakness and then dilation of the vessel at the weakened spot, this is followed by a periarteritis. We have as a result a small aneurysm, varying in size from one-hundredth to one twenty-fifth of an inch in diameter. On post-mortem examination it is common to find from ten to one hundred of these small aneurysms. We term them miliary aneurysms. The hemorrhage is the result of the rupture of one or more of these aneurysms.

Then, again, we may find a fatty degeneration of the walls of the small cerebral blood vessels. This is usually the result of purpura, scurvy, marasmus, leucocythemia, or post-infective states. This form of arteritis, however, is much more common at an earlier period of life, yet does sometimes occur as late as sixty years of age or possibly, even later.

In the embolic form, there may not be any evidence found of disease of the cerebral blood vessels. Simply the area of anemia or softening, small emptied vessels beyond the plug, a slight enlargement of the plugged vessel just back of the plug, and the plug itself. In some cases a hemorrhage occurs as a result of the increased blood pressure at this point, or the embol, by stopping the blood current, may raise the pressure sufficiently to cause a rupture and hemorrhage.

Atheroma affects the larger vessels only. The elasticity of the walls is materially lessened and as a result hemorrhage frequently occurs. There is a thickening of the inner coat (endarteritis deformans) and fatty degeneration (atheroma). The result is an opaque yellow thickening, not always, but frequently calcified. There may be only one or a number of these spots, but there is a tendency to spread along the coat of the various vessels implicated. These nodular degenerations always change the caliber of the vessels, sometimes enlarging them, at other times reducing them, or occluding them entirely; when they occlude a vessel, they constitute a thrombus. While the smaller vessels are not usually affected in proportion to the degeneration, changes do extend into them at times to the extent of entirely obliterating them. The frequency of hemorrhages in the brain as to location are as follows: Caudate and lenticular nuclei, meninges and cortex, centrum ovale, optic thalamus, pons, cerebellum and medulla.

Hemorrhages in the cortex are usually small, ventricular are usually the result of rupture about the basal ganglia. Hemorrhages in

the pons are often in the median line. Those in the cerebellum are from rupture of the superior cerebellar artery, and are apt to be into the fourth ventricle.

After a hemorrhage, the blood first forms into a clot, and in a very few days softening of this clot begins; then nature begins in the course of a week or two to form a fibrous wall around the clot; in from three to four weeks, the contents within the wall become fluid; and at the end of six or eight weeks the fluid is absorbed, and the walls of the cyst close together, leaving a cicatrix. This may for some time continue to contract, or be nearly absorbed in time. The tissues about may undergo some secondary degeneration; in fact, a marked softening of a greater or less area not unfrequently takes place.

Diagnosis. — Hemorrhages may be differentiated from epilepsy, by the initial cry, the short duration of coma, the biting of the tongue, the dilated, equal and reacting pupils, and the absence of paralysis, always present in the latter. From uremic poisoning by the absence of hemiplegia, the kidney physiognomy, and an analysis of the urine.

From alcoholic coma, by an incomplete coma, the absence of low or unequal temperature, and the alcoholic odor of the breath.

The diagnosis of embolism is made by the presence of a source from which an embol can come. The comparatively short coma, accompanied or preceded by first paralysis and then convulsions. There is rarely any serious change of temperature. Embolism is much more rare as age advances.

Thrombus is not always easy to diagnose from the other forms of apoplexy, but the presence of evidence of arteritis, the general asthenic condition, a weak or fatty heart, the presence of the prodromal symptoms and the absence of stertorous respiration, point to thrombus.

Prognosis. — In hemorrhagic apoplexy I should say that the progress generally is favorable in the first attack, and grows less favorable with each succeeding attack. By favorable I mean a return to fair or even good general health and a marked improvement in the paralysis. The paralysis will improve to some given point and remain practically stationary, although I think that there is nearly always some improvement to be noticed from year to year.

If coma is very profound and lasting, and there are changes in temperature and pulse, the prognosis is less favorable. After the third day of coma, each succeeding day reduces the chances of recovery. A comparatively rapid rise of temperature during coma is unfavorable. A subnormal temperature at the onset is unfavorable.

The presence of syphilis, of kidney disease or of alcoholism increases the gravity.

In embolic apoplexy, unless the initial onset is very severe, the coma unusually profound and prolonged, the convulsive movements severe, the prognosis is more favorable, not only as to recovery from the apoplexy, but the recovery from the paralysis is much more rapid, and often complete.

In the thrombic apoplexy the prognosis is less favorable than in either of the others, but is dependent to a great extent on the extent of the arterial disease present and the age of the patient.

The prognosis in the cases of serous apoplexy depends mainly on the condition of the heart, the general tone of the system, the age and movements of the patient. Many cases recover entirely.

Treatment.—The patient should be laid in a horizontal position and kept quiet. The bed should be arranged for protection from soiling by urine or feces, so that sheets may be changed with the least possible disturbance to the patient. The mouth and throat should be kept clean and free from accumulation of mucus, by the use of anti-septic swabs. The pulse should be counted and recorded every hour. The temperature should be taken and recorded at least once in two hours, and always per rectum or vagina, during the coma. If the head is very hot and the face very dark and purple, cold cloths may be used continuously until these symptoms subside, at least in a measure. Leave directions with the attendant that you are to be called at once in case of convulsions, a sudden paleness, or a rapid change in temperature or pulse. Give Aconite one drop every twenty minutes for three or four hours. Having attended to these matters with great care as to detail, the doctor should turn his attention to the family, also he must not allow himself to risk the life of his patient, by doing or allowing too much to be done. There is more real danger to the patient by overdoing than underdoing. The position of the patient may be changed slightly every two or three hours, but constant fussing around the patient, must be avoided, and the room, and house must be kept quiet. The doctor should explain all this to the family and the attendants. If the bowels do not move within 10 or 12 hours of the attack, a cathartic should be given. In selecting the cathartic, attention must be directed to getting a good, free movement with a small dose, pills should not be given, as they are very liable not to be swallowed, but simply lodge in the throat, be partly swallowed, and partly removed with the mucus. There is danger also of producing strangling by severe coughing. A quarter of a grain of Elaterium, or half a teaspoonful of a reliable fluid extract of cascara, is probably as reliable as any cathartic that can be selected. The bowels should be moved at least once in 24 hours until the return of consciousness.

After the first three or four hours *Arnica* is probably the best remedy to use,—the 3x every two hours. This is the remedy whether the attack be the result of traumatism or not. It is supposed to check additional hemorrhage, and to prevent the tendency to its recurrence. The patient should be given at regular intervals, liquid nourishment, in small quantities, but no beef tea.

If there be a sudden rise in pulse and temperature, *Aconite* in drop doses every half hour for two hours, then every hour, is probably the best remedy.

If there appears a marked divergence between the pulse and temperature, no treatment will be of avail. Under these circumstances there is no remedy that ought to do as much as five-drop doses of the deodorized tincture of opium once an hour. If there appears a sudden pallor and weakening of the pulse, *Ferrum phos.* (3x trit.) every fifteen minutes, or if collapse seems very imminent, surround the patient with hot bricks, hot-water bags or blankets; cover very warm and give three- to five-drop doses of aromatic spirits of ammonia. After the coma has subsided, the following remedies are indicated:—

Aconite (3x).—Pale sunken face, skin cool, pulse weak and slow, numbness and tingling.

Agaricus.—In enfeebled state of the brain, patient is giddy, weak, apt to tremble, loss of memory, and dimness of vision, is indicated in those cases that have been preceded by unusual wakefulness and excitement or irritation of the brain, especially if there is much twitching of the face and limbs with dilatation of the pupils.

Arnica (30x).—In traumatic apoplexy, and serous apoplexy, especially. In the hemorrhages it is useful to promote absorption.

Baryta iod. (6x).—In torpid chronic cases to promote absorption of the clot, is useful to prevent recurrence, especially from sexual excitement. Is especially adapted to delicate and old people.

Belladonna (3x).—Flushed face, a bloated appearance, violent beating of the carotids, pulse full, hard and strong, eyes red with pupils widely dilated, muttering, distortion of the mouth, difficulty or inability to swallow, and obstructed respiration.

Cocculus (6x).—Emptiness and hollowness of the head (a sensation of dizziness) with great nausea and vomiting, and a tendency to faint, formication of hands and feet, and difficulty in speaking and thinking.

Conium mac. (2x).—Face bloated, purple or livid, skin cool, pulse slow and feeble, pupils contracted and breathing extraordinarily difficult and oppressed. This remedy is decidedly homœopathic to the symptom, paralysis.

Cuprum aceticum (6x). — When preceded by convulsions, is unusually pale, a marked general deficiency of bile.

Ferrum phosphoricum (6x). — Violent arterial congestion to the head, with powerful beating of the heart and arteries, great redness and heat of the face, severe headache, heat and fullness of the head, heat of the skin, dizziness from rush of blood to the head, particularly adapted to hemorrhagic and embolic apoplexy.

Ipecac (3x). — When there is great and constant nausea, and asthmatic breathing.

Glonoin (4 to 30x). — For the severe and sudden congestions. In those cases where collapse is imminent from marked heart depression, the remedy given in the one hundredth or one two-hundredth of a grain dose may save life, and acts, if at all, very promptly.

Hyoscyamine (Mercks) (4x trit.) — Where there is a high state of nervous excitement, especially if more or less delirium with muscular twitching.

Nux vomica (30x). — Best adapted to convulsive apoplexy, limbs in a state of permanent and rigid contraction, face pale or lurid, pupils contracted.

Opium is one of the great remedies in apoplexy, and may be of service under many different conditions, and in all strengths, from the deodorized tincture to the highest potency.

The deodorized tincture is frequently of service during the state of coma, as indicated under the treatment for this stage.

The 3x dilution in mild congestions with roaring in the head, when there is a marked difficulty in speaking and swallowing, some difficulty in respiration, a soft, full and slow pulse, a low state of consciousness, somnolence, or a tendency to sleep a great deal. In the thirtieth dilution or higher, where there is a tendency to excitement with laughing, confused erroneous talking, restlessness, redness of the face and eyes, contracted pupils, grasping at the head, drawing the tongue to one side and coldness of the paralyzed limbs.

Phosphorus (30x trit.). — In debilitated patients, great exhaustion, pulse small and feeble, rapid or slow, limbs cold, hiccough, rattling respiration, and cold, clammy sweat.

Nearly any of the phosphorous preparations may be indicated in the debilitated cases.

In the cases dependent upon syphilis, potassii. iod. in 5-grain doses and upward are frequently necessary, and will work almost wonderful results in the promotion of absorption, and there can be no doubt to-day from the vast clinical experience with this drug that it has prevented, in many cases, recurrence of the attacks. On the other hand mercury

can never be indicated in crude doses for syphilis affecting nerve tissue. Mercury in potency may be and usually is indicated in the class of cases where there is evidence of single or multiple neuritis. There is no question that the heroic use of mercury internally and by inunction has produced neuritis in a large number of cases.

Nitric acid (3x to 30x) is a remedy that should be considered and its indications carefully studied in syphilitic cases.

The treatment of the resulting paralysis requires special attention. In the first place it must be clearly understood that the paralysis is a symptom. It is not the disease, nor a disease. If the part of the brain affected could be restored to its normal conditions, the paralysis would cease at once. The paralysis does actually recover just in proportion as the lesion in the brain subsides. If in any case we were certain that the brain could be made normal in even two or three months, we would not need pay any attention to the paralysis, but as the muscles from long-continued inactivity are liable to undergo a greater or less amount of degeneration, and to contracture from loss of antagonism, it is necessary to use certain means to preserve them intact, and to prevent these contractures. The prevention of contractures presents the first problem, and to solve it the utmost care is required on the part of both the physicians and the attendants.

As soon as the coma has ceased, passive motion of all the paralyzed muscles should be practiced several times a day, quite gently for the first five or six weeks, then gradually increase the motions in vigor. These motions must be to the full limit of possibility in health; of course it is understood that in passive movements the patient has no part; it is all done by the attendant. The patient must not be allowed to have the hand partly closed, or in the same general position any length of time. The fingers must be rested on some object that will permit the wrist to drop lower than the hand, thus keeping the hand and fingers open and the hand turned back, a half hour to an hour at a time, three or four times a day. The attendant should also watch to see that the leg and foot are not allowed to lie in the same position any length of time.

In from two to four weeks after return of consciousness electricity may be employed, and kept up continuously for an indefinite period, two or three years if need be. Begin with the faradic current to the paralyzed members, just strong enough to produce slight contraction of the muscles. It may at this time be applied in any direction. Later, in three or four weeks, the galvanic current may be of service. It should be first used as a test of the direction in which the current will be most effective. To learn this, apply one pole over the spine and the other

over motor points in the arm, then produce interruption of the current within the metallic circuit, gradually increasing the strength of the current until you get slight contraction in the paralyzed muscles, then note the exact strength of current and reverse it; that is, place the positive pole where the negative was, and the negative where the positive was; note the exact strength required to produce contraction. The direction in which contraction is produced by the lightest current, is the direction in which the current should be run in the treatment.

A galvanic current of from twenty to thirty minutes' duration to the arm and leg should be given twice a week for the first six months; it should be about ten to fifteen milliamperes, later strong enough to produce slight contraction on interruption of the current. As soon as the proper direction of the current has been established, the faradic current should be used in the same direction, applied daily for thirty or forty minutes for the arm and leg together. Massage should also be given to the paralyzed parts daily. The so-called vacuum treatment is also a valuable adjunct, using the boot for encasing the leg its whole length, and the arm piece for the entire arm. This may be given about twice a week with benefit.

If there is swelling of the paralyzed members and marked pain along the course of a nerve, the massage, faradic electricity and the vacuum treatment is contraindicated for that member; but the galvanic treatment may be used, and in addition dry air heated to 250° to 300° F., may be applied two or three times a week.

The patient after the first three months should be instructed and encouraged to use the paralyzed members as much as possible every day.

Urine.—The urine should be analyzed at regular intervals. The analysis should be quantitative of the entire twenty-four hours.

Bowels.—It is absolutely necessary in a large percentage of the cases to use artificial means to produce bowel movements. It is much better to move them from above than by enemas.

Sometimes the faradic current, the negative pole in the rectum as high as the sigmoid, and with the positive pole kneading the abdomen thoroughly, will accomplish the purpose. Massage will sometimes do all that is needed.

Where these means fail, the following prescription is probably the most satisfactory, as it can be used for any length of time, and can be regulated so as to give on an average one fairly natural movement in each twenty-four hours without discomfort.

Fel Bovinum Ext.....	grs. 60
Hydrastia Mur.....	grs. 4
Aqueous Ext. Aloes.....	grs. 4
Physostigma Ven. Tr.....	gtt. 24
Mx. Div. Capsules 12.	

It may be found necessary to give two of these capsules at night for a day or two, then one can be dropped off each day, until only one a day or night, and then gradually increase the number until satisfactory results are obtained, and then gradually diminish the number again.

SOFTENING OF THE BRAIN.

Softening of the brain is so closely allied to apoplexy that it is most frequently mentioned under that head, but there are cases that are not dependent on any form of that disease.

Acute softening very frequently follows closely on Embol or Thrombus, and is a direct and natural result of the cutting off of nutrition through the blood supply.

In a certain number of the cases softening of brain tissue takes place immediately and goes on very rapidly. In these cases there are no distinctive signs, simply a continuation of the primary coma till death takes place.

In other cases there will be a recovery from the coma, and in a few days or weeks a sudden convulsive attack followed by coma and death. In still another class of cases there will be severe headaches, the pain seemingly referred to the inner part of the brain, frequent attacks of vertigo or giddiness, followed by dullness of comprehension, a vacant expression, forgetfulness, with frequent threatening of an apoplectic seizure. In these cases there can be no doubt that softening is going on in the region of the primary lesion.

In these cases it has seemed that something may be accomplished by treatment. The general treatment to be followed is in the line of thorough general nutrition and the prevention of accidents through undue exercise or excitement. Keep the patient as quiet as possible, both mentally and physically; at the same time give him an abundance of fresh, pure air and sunshine. Feed thoroughly on good, healthful, but easily digested foods. Watch the digestive tract carefully, as any great disturbance of the digestive organs may speedily prove serious. Keep the bowels free, securing a good movement every day by means of remedies, or, if necessary, by mild aperients. See that all cause for excitement is avoided.

The two remedies that seem to accomplish the most in these cases are *Nux vomica* (3x) and *Opium* (3x).

An inflammatory softening may also be noted. That is a condition in which there is one or more spots, small and quite circumscribed, either deep in the brain or near the surface. This most frequently occurs in syphilitic cases, but also in the tuberculous and the poorly nourished generally. It is probable that many, if not all, of these cases are due primarily to rupture or embolism of the very minute blood vessels or to thrombic degeneration in the minute vessels.

The initial symptoms are exceedingly vague and uncertain. There may be slight febrile disturbance. The first symptom at all well marked is a steady, exceedingly harassing headache, the pain darts through the head and seems to come from the center of the brain, now in one apex and then in another. It is always paroxysmal and sometimes intermittent. There is likely to be confusion of the mind and apprehension of losing the mind. At night there is likely to be restlessness, excitement and delirium and occasionally a convulsive paroxysm. There is apt to be nausea and vomiting.

In a very short time strange sensations will appear in one or both limbs on the same side, followed by formication and prickling and a feeling of weakness in these limbs. The head pain has now become localized and more constant.

Now the headache stops; the restlessness is succeeded by a growing torpor; the memory fails; it becomes difficult to comprehend, and later, quite impossible to find words to express any thought. The face is dull and heavy; the pupils may be contracted or widely dilated and insensible to light. A pronounced hemiplegia appears. The pulse is slow, the skin flushed at times, at other times covered with a cold, clammy perspiration; the tongue red and rather dry; the bowels constipated.

Now there may be an attack of coma or somnolence. There may be several such seizures in a very short period. There may be an apparent retention of considerable intelligence and yet the patient is absolutely unable to utter a single word. The paralyzed limbs are often very painful and move convulsively, or there may be a tonic spasm of the flexors, the limbs remaining permanently flexed by this contracture.

Then, again, the patient may gradually sink into a coma, rapid emaciation, pulse quick and intermitting, tongue parched and crusted in the center, the teeth and gums covered with sordes, eyelids glued together, bronchial râles, inability to swallow, involuntary movements of the bowels, and death in from five to sixty days.

The *Treatment* in the early stage may prove effective; in the late stage it never can. It is doubtful whether any treatment even ameliorates or modifies the symptoms.

The first consideration in the treatment is thorough nutrition and quiet. This must include the regulation of the general circulation somewhat. The next important element is to counteract the dyscrasia. For this class of cases Iodide of Potash is never to be used in large doses, but in the 3x or 6x, or nitric acid in 3x or 30.

Stillingia tincture in from three- to five-drop doses will frequently control very effectively the pains in the head, and is also indicated for a syphilitic patient.

Guaiaacol carbonate: five-grain doses in capsules three or four times per day should always be given in the tubercular cases.

In cases of general dyscrasia of the suppurative tendency, where neither syphilis nor tuberculosis can be made out, the constitutional remedies most likely to be of avail are *Calcarca carb.* (30.), *Hepar sulph.* (4x) or *Sulphur* (30.). Hyoscyamine (30. trit.), made from Merck's Hyoscyamine — for the inability to utter words, the involuntary movement of the bowels and the profound and prolonged coma.

Aconite (30ϕ) for the pains in the paralyzed limbs, *Belladonna* (3x) or *Stramonium* (2x), for the convulsive movements of the paralyzed limbs.

Opium (3x), for the convulsive movements, the parched and encrusted tongue, the gradually increasing coma and the profound coma.

Iodine (30.), for the rapid emaciation.

Nux vomica (3x), or *Plumbum* (3x), for the tonic contraction of the flexor muscles.

Digitalis (Infusion), or *Glonoine* (30.), will best control excessive action, or irregularity, or intermitting of the heart.

In the early stages a reliable Fluid Extract of *Cascara Sagrada*, in from five- to ten-drop doses, three or four times per day, will probably do better service in keeping the bowels open than any other remedy. In the later stages I think it better to depend on enemas.

CHRONIC CEREBRAL SOFTENING.

This is almost exclusively a disease of old age. It is the result of the natural changes taking place in the blood vessels and tissues generally. In probably ninety per cent of the cases, there has been a history of dissipation of some sort. In many it is simply carrying ordinary social life to a point of extreme dissipation; or it may be dissipation in the way of excessive close mental application for a long period, or as in most cases, those habits ordinarily considered as dissipation.

The onset is very gradual and insidious. The first indications are to be seen in an altered manner and failing intellect. The headache

and the nausea are not at all prominent, if present at all. All the mental faculties become clouded, the memory fails, the speech is slow, hesitating and incongruous. There is a failure to remember familiar names or objects. This condition, growing slowly more and more pronounced, may last for months. Patients then begin to have formication and prickling in one or more members, quite frequently in the fingers; then some loss of power in one or, perhaps, in all the limbs. An inability to grasp objects firmly with the hand, or a dragging, feeble movement of one or both legs.

There is quite frequently, but not always, tonic contracture of the flexors of arms or legs. There will be considerable pain in the contracted limbs, in the joints as well as the muscles. The pain is increased by motion. There may be some anesthesia in the contracted limbs. The face gradually loses expression and becomes somewhat distorted. There is a general appearance of old age. The paralysis gradually becomes more pronounced, and extends to other parts. It becomes impossible to retain the contents of the bladder or bowels. The whole body wastes. The mental condition gradually grows more and more feeble; hallucinations of various kinds appear, and the patient sinks into a condition of oblivion and finally death.

The *Prognosis* of chronic softening is always grave. I think no well-authenticated cases were ever helped in the least.

I do not know of any *Treatment* to suggest, other than the best of care and thorough nutrition. The tissues have, seemingly, not only lost all power of building themselves up, but of regaining that power.

In the early stages of suspected chronic softening, Arsenicum alb., Secale, Phosphorus and Picric acid are the remedies most likely to be efficacious.

CEREBRITIS.

Synonyms. — Encephalitis, Inflammation of the Brain Tissue.

A general inflammation of the brain substance is quite uncommon. circumscribed inflammations not so. This is nearly always a secondary disease.

Etiology. — Cerebritis may result from blows on the cranium either at the point of contact or on the opposite side of the brain; punctured wounds or fractures of the skull; infection following operations, bone disease and meningitis. There will often be a zone of congestion about a hemorrhage, an embolus, a thrombus or a tumor; if from any source, infection occurs, inflammation will follow.

Pathology. — Engorgement and edema, the tissue is rather soft and of a reddish hue. There is a destruction of the nerve cells and a

proliferation of the neuroglia. This will be followed by shrinking of the inflamed portion, and a sclerotic thickening.

The **Symptoms** are practically those of meningitis. In a few cases the inflammation will be in distinct focalized centers, when it may be definitely diagnosticated.

Chronic Cerebritis may exist, but has no distinctive features. There will be a general interference with brain functions.

CEREBRAL ABSCESS.

Etiology.—Is always the result of pyogenic bacteria. It may be the result of localized cerebritis. Diseases of the middle ear, accompanied by suppuration, mastoid disease, suppurating injuries of the skull, septic nasal and pharyngeal diseases. Suppurative processes in any part of the body, tuberculosis and syphilis.

Pathology.—The pathology of abscess in itself, is simply a broken-down mass of nerve cells, fibers, granular fibers, and leukocytes. The abscess may become encysted and chronic, in which case it is surrounded with a rather thick fibrous wall. Usually there is but one abscess, but there may be a number.

Symptoms.—The symptoms present a wide variation, depending on the virulence of infection, the rapidity of growth, the position, the cause and the complications. As in all abscesses, there must first be inflammation. There will be a low, irregular vascillating fever, and there may or may not be chills or chilly sensations. The temperature during this stage is often subnormal. There is apt to be an intense persistent headache, sometimes general, but often confined to a small area, and this may indicate the seat of the trouble, but has nearly as frequently been found to be at a distance. Very frequently there is vomiting and constipation, or diarrhea. There may be delirium, usually of a rather mild type or simple mental lethargy; a little later there will nearly always be decided chills and profuse sweating.

There will now come a period in which all or nearly all the symptoms become very much lighter or they may even disappear. There is likely to be occasional chills or chilly sensations, unusual attacks of perspiration, occasional sharp headache and emaciation. This marks the subsidence of acute inflammation and the gradual increase in the size of the abscess, and the formation of the fibrous wall.

This may continue for an indefinite time. In some cases the termination follows the inflammatory stage at once. The terminal symptoms are much the same in either case. Suddenly comes and rapidly runs this terminal stage, whether it be early or after a long period of remission. Not always the same, however, the abscess may

rupture, causing a rapid infiltration of pus in the capsule, or in the medulla, or it may break through the cortex and produce a rapid purulent meningitis. We do not always find this condition present, and yet the terminal symptom, a sudden coma, with or without convulsions, and as a rule, without premonition, is there, but without determinable reason. The convulsive attack is frequently of the Jacksonian type and with conjugate deviation of head and eye. Death may occur in a very few hours, indeed in some cases it is practically instantaneous.

In other cases the first coma subsides, the early symptoms of pain, fever, etc., reappear, with a hemiplegia or monoplegia of spastic variety usually. Nystagmus, unequal pupils and paralysis of various eye muscles are common. Delirium, convulsions, coma and death.

Some authorities have observed a higher pitch or tone on percussion over the affected part, also an increased temperature. In many cases it is impossible to locate the abscess. If it is located in any of the centers the function of which is well known, the localization is made out the same as for any of the lesions. If there has been an injury, or an ear or mastoid disease, the abscess is probably in the same region.

Diagnosis. — By the history and the presence of the symptoms described. It frequently cannot be differentiated from encephalitis or meningitis. In the later stages, hemorrhage may so closely resemble it as to make differentiation impossible. The presence of any possible source of infection, followed by the cerebral symptoms enumerated, render abscesses very probable.

Prognosis. — Very grave. In some cases an abscess may remain encysted for years, and the final rupture no doubt accounts for a number of sudden deaths. Recovery under very favorable circumstances as to location for operative interference is possible.

Treatment. — The treatment first is prevention of infection, and surgical, after an abscess has formed.

CEREBRAL PALSIES OF CHILDREN.

Paralysis in children from disease or malformation of the brain are not at all rare.

Etiology. — The upper neuron is developed in the last month or six weeks of pregnancy, and is not complete for several months following birth, therefore children born prematurely are apt to have an illy formed upper neuron, or one devoid of resistance. Anything in the heredity or in the mother during pregnancy that may interfere with the nutrition of the child in utero, may cause or predispose to defective

upper neurons, and as a consequence, paralysis. There may be a lack of brain substance in whole or in part. There may be any condition between a perfectly normal brain and an absolute absence of any part. Cases are reported of intrauterine traumatism, encephalitis or meningitis, and the child born hemiplegic.

At birth long-continued pressure or the use of the forceps may result in a cerebral paralysis. Spencer, McNut, and Litzman have proved that hemorrhage does at times occur in the cerebro-spinal membranes during labor, which may result in death or in a degree of paralysis.

After birth the causes are the same as in adults.

Symptoms.— In prenatal cases we of course know nothing of the beginning. In those cases occurring at birth, there is often a so-called asphyxiation, a coma, or convulsion and the paralysis.

In the post-natal cases occurring in from a month to three years after birth, there is fever, vomiting, delirium, stupor; some form of convulsions which may be unilateral or bilateral. This lasts from a day to a week; when following a convulsive attack, either immediately or very soon after a hemiplegia is found. The physicians should remember that a more or less extensive paralysis may be present in babies without being noticed. Improvement in the paralysis is quite likely to begin in a few weeks and continue for some years. The hemiplegia usually involves the hypoglossus, face, arm and leg of one side. With the paralysis there are symptoms of motor irritation usually most marked in the face. The paralysis is usually most marked in the arm. About the time that the paralysis begins to improve, contraction of various muscles begin. This contraction may remain as at first, or may gradually become more pronounced. These contractions are of such a nature as to cause an arm, hand, the fingers or a leg to assume rigidly very grotesque positions. In some cases there are very pronounced contractures with very little paralysis. At times there is a spastic condition, in which every attempt at voluntary motion is accompanied by spastic contracture, often to such an extent as to interfere materially with the movement. Associated movements are quite common. The contractions are not at all uniform in the variously affected muscles.

Some nine to twenty-four months after the first appearance of the paralysis, chorea or athetosis in an aggravated form appears in a large proportion of the cases. These movements affect the upper, then the lower extremities, and the face very much less than either. They may appear only on a voluntary effort, or be nearly continuous during waking hours, or absolutely continuous day and night. There is in a very few cases atrophy, but usually, if anything, overdevelopment of the muscles.

Trophism is interfered with on the paralyzed side as shown by the slower growth of that side.

Sensory and electrical disturbances are not always present.

Diplegic Cases.—In some cases of cerebral palsy in children, the paralysis is on both sides, or bilateral. The same set of muscles are affected with the exception that the face is usually less so. In a few instances the two legs are affected, and there is at first sight simply a paraplegia, but close examination and observation will reveal some defect in speech, more or less pronounced mental symptoms, and clumsiness in the use of the hands and arms.

Epileptic attacks are very common, and are irregular as to frequency. There may be quite long intervals of freedom, and again a continuous series of attacks in rapid succession for a time.

The convulsive action is frequently confined to the paralyzed parts, but not always. The mind becomes affected and often increasingly so. There may be any state from a slight mental dullness to absolute imbecility.

In this connection *Little's disease* may be mentioned. It is of congenital origin, but appearing a short time after birth. The first sign to be noted is that when the legs are separated, there will be rigidity, and a determined effort for them to draw together again, they are immediately adducted again. As the child learns to walk, this causes him to be knock-kneed; at times the thighs will cross at every step; the heels are raised from the ground. Some form of club foot nearly always follows. The entire leg is moved as if there was but one leg bone from the hip to the toes. The arms may be involved but rarely.

There are usually accompanying symptoms to show clearly that it is a cerebral disease, such as strabismus, disorders of speech, mental conditions, athetosis and epileptic attacks.

Prognosis.—The prognosis is not favorable as to an absolute cure, nor can as a rule, great improvement be expected, except in the *Little's disease*. In the latter there is often a very marked improvement or even complete cure.

In the other forms, some improvement in paralysis is to be expected within the first year, and improvement may continue for a number of years.

After the epileptic attack, the athetosis or the chorea are fully established and a cure is very rare.

The prognosis as to intelligence depends upon the amount of development during the first year. The few cases resulting from hemorrhage and acute encephalitis may entirely recover.

In a few cases the cure is so nearly complete that careful

observation is needed to detect any evidence of disorder. The prognosis as to life is not so bad. Patients do die as a result of the convulsions, may with any of them, but they frequently live to quite old age and may lead more or less useful lives.

Treatment.— In Little's disease muscular quiet from the first is important. Do not allow the child to use the muscles in any way, to any extent. The hydropathic heat treatment is very valuable here. The very young child can be put into a hot water bath at 100° F. for about five minutes, taken out and gently rubbed over the affected muscles. If the patient is 5 years or older, the water may be 102° F. for about 7 or 8 minutes.

Gentle massage is also very important. Passive motions of the affected members, in such manner as to place the contracted muscles on a stretch, and held so for some minutes. As the case improves, rhythmical volitional movements should be made.

A light galvanic current combined with stretching of the contracted muscles should be used from 2 to 3 times per week, for about 3 minutes to each set of muscles.

Surgical interference in the line of tenotomies has seemed to be useful in some cases. Orthopedic methods are always advisable. In other cases at the beginning, if from hemorrhage that can be located, the skull should be opened and the clot removed. Late in the case cerebral operations have not been established as useful. Here too, hydropathic treatment, massage, galvanism, passive and volitional movements are fully indicated and there is sufficient hope of amelioration and final cure, except in the worst cases, to make it the duty of the physician to insist that the treatment be thorough and continue through year after year.

The epileptic element will render it absolutely necessary to use the bromides or hyoscyamine hydrobromate persistently but very cautiously. I have in two cases succeeded in keeping this element under control with *Passiflora* tincture from one to two teaspoonful doses 3 or 4 times per day without having any bad effects.

No remedy covers or nearly covers the symptomatology of this disease in any of its forms.

Fortunately clinical experience has abundantly proved that we can do very much for these cases, by persistently prescribing constitutional remedies. Select in these cases a remedy to fit the patient with all his heredity, his peculiarities, his dyscrasias and the modalities, give it continuously and steadily for a long period. Zinc phosphide (1x to 3x trit.) is among the best. The iodides, the calcareas and the natrums. If there be a syphilitic heredity, Merc. iod., Kali iod. or Nitric acid.

CEREBRAL TUMORS.

Nearly any kind of a tumor may develop in the brain. In children the tubercular, while in adults, sarcoma, syphiloma, and glioma are most frequent. Tumors occur most frequently in the cerebrum, next the cerebellum, the pons, the central ganglia and the quadrigemina, orbit, etc. It is probable that they are sometimes resultant from malignant growths in some other part of the body. Traumatism may be an immediate cause, but not as frequently as has been supposed.

Symptoms.—These are divided into the general or those not depending on the location of the tumor, and focal, or those peculiar to the location.

It is a fact that tumors have been found at post-mortem when there had been no possible indications during life. In some cases the symptoms are very mild, while in others they are very severe. Notwithstanding this wide variation, the symptoms are usually sufficiently characteristic to make the diagnosis reasonably certain.

The first symptom observed is usually headache, it is most frequently frontal and occipital. It is usually quite severe. In some few cases this symptom may not be present till quite late. It may be very moderate for a long time. The headache grows gradually worse and more continuous, has distinct and most excruciating exacerbations, and is aggravated by coughing, sneezing and like forced expiratory movements. Vertigo is another symptom likely to occur rather early, but many times quite late, but this is not often severe enough to cause staggering or falling. There is quite likely to be more or less vomiting of the true cerebral type, at intervals throughout the course of the disease.

In my own experience I have more frequently found the patient suffering from loss of vision, many times a rapid loss, as the first indication. This of course simply means that a large percentage of my cases have been so located as to cause blindness. In every case of headache, if at all severe, or persistent, an ophthalmoscopic examination of the eye by a competent physician should be made. A choked disk is almost universally present with cerebral tumor, and if it can not be accounted for in any other way its presence is sufficient to render a careful examination for tumor necessary.

During the entire course there may be a tendency to convulsions general or local, this is more marked late than early. Very often simple transitory attacks of unconsciousness occur without any spasm. Paralysis occurs, but belongs to the focal symptoms, and will be mentioned more at length. There is often a melancholia, a dementia, or

simply hallucinations, or a slow irregular mental action and lethargy. Stupor especially in the later stages is quite apt to be present, and finally coma.

Focal Symptoms. — Small tumors may be in nearly any part of the brain and not produce any localizing symptoms. Even large tumors in the right frontal, right temporal, and part of the right parietal lobe, present no characteristic symptoms. If a tumor is of sufficient size to produce marked general cerebral pressure, the focal symptoms will be observed.

Motor Zone. — Usually first a feeling of stiffness, followed by actual rigidity or slight spasms in the face, arm or leg; this may be present some time before any of the general symptoms appear. It comes on in distinct attacks, of short duration, is at first confined to the same group every time, but later is apt to spread to the entire side of the body. In the early attack there is no unconsciousness, and sometimes not even in the later and more severe seizures. Later the seizure becomes nearly or entirely constant.

The paralysis not only increases in severity, but gradually spreads in extent. The extension is the result of the growth of the tumor causing pressure on additional motor centers, and therefore, will in one case spread in one way and in another in a different way.

Tumors of the Special Centers. — If a tumor grows in the left frontal or temporal lobe, there will be symptoms of aphasia. If it be in the third left frontal convolution, early motor aphasia gradually increasing to a total and permanent loss of speech. If in other parts of these lobes, the aphasia comes on later, and will be less pronounced. If in the *temporal lobes*, there may be hallucinations of hearing; if in the posterior basal part, it may cause *optic aphasia*.

If the patient is left-handed, lesion in the right side may cause the same line of symptoms.

Tumors of the Visual Region, if in the occipital lobe, we may have a pure psychic blindness and will have hemianopsia, as the only focal symptom. If situated anywhere along the optic tract, there will be hemianopsia, and, in addition, involvement of one or more of the other cranial nerves, producing most frequently paralysis of one or more muscles of the eye.

Tumors of the Central Ganglia. — Focal symptoms appear late, and as a result of pressure in the internal capsule. They are incomplete hemiplegia, with twitching more or less and possible athetotic signs.

Tumors of the Quadrigeminal Region. — Amblyopia, bilateral paralysis of ocular muscles, impaired hearing and inco-ordination in walking or standing. Tremor of the intention type is frequent.

Tumors of the Cerebellum.— Vomiting appears early and remains all through. Vertigo and inco-ordination are very prominent. There will be very severe occipital headache, extending down the back of the neck. There may be also frontal headache. Convulsions either general or unilateral are prominent in most cases. Opisthotonos is quite common. Papillitis is always present.

Tumor of the pons and medulla oblongata gives rise to hemiplegia alterans, that is, a paralysis on one side of the face; it may be the muscles supplied by the trigeminus, the facial, the abducens or some other one of the cranial nerves, and of the body on the opposite side. Various sensory symptoms are quite common. Hemiataxia occasionally occurs. Both these regions give practically the same symptoms, with the exception that those of the medulla involve most frequently and markedly the 8th to the 12th nerves. There is quite likely to be disturbance of the heart and respiration. There may be bilateral paralysis. Vasomotor disturbances are frequent.

Diagnosis.— In every case of severe persistent headache, if other sufficient cause can not be discovered, have careful ophthalmoscopic examination, and if a neuro-retinitis, choked disk or a papillitis is present, a tumor is almost certain.

Any obscure case, such as a cerebral tumor is likely to be in its early stages, should be referred to a specialist for diagnosis. The differential points are necessarily of a technical nature, too technical for a work of this kind.

The X-ray is of little or no value in these cases. It is possible that we may at some time be able to use this agent with much better results.

Treatment.— The first question to be answered is as to what the surgeons can do in these cases. In order to determine this, the tumor must first be located, and if on or near the surface, it must not be too diffuse; there should be established that there is but one tumor. It should not be metastatic or malignant. A very small proportion meets these requirements. Every case that does with reasonable certainty, should be operated on at once. If there is reasonable probability that it is of syphilitic origin, the treatment should be the iodide of potash in large doses. This line of treatment has been so thoroughly established by clinical experience, that any physician who allows his patient to become incurable from a syphilitic tumor of the brain, without it, is culpable. There is positively no room for dispute as to this line of treatment in these cases.

I commence with five-grain doses in solution of water, 4 times per day, continue this one week; then increase to ten-grain doses for three

days, fifteen-grain doses the next three days, continuing to increase in the same proportion every three days, until I get decided evidence of stomachic disturbance, when I stop it entirely for a few days or a week, and then commence at one third the last dose and increase as before. I do not hesitate to increase the dose if necessary to 160 grains, 4 times per day.

In conjunction with the iodide of potash I always use bismuth subnitrate in from one- to five-grain doses. I give the iodide right after a meal, having the patient take food just before retiring or at the time for the night dose, giving the subnitrate halfway between the doses of the iodide. I continue the subnitrate during the time I am not giving the iodide.

The iodide of potash has without doubt been efficacious in other kinds of tumors as well, but can not be said to warrant special hope of a cure, arresting the development or ameliorating the symptoms. As to curative remedies aside from this I know none.

If the symptoms are not too severe, I always, as carefully as possible, select the indicated remedy according to the symptoms, and am sure in many cases I have succeeded in giving the patient much comfort. Hypnotics and narcotics must often be used. In this class of cases while I have tried a large number, I am satisfied that opium in some form will always give the most satisfaction. It may be morphia sulphas hypodermatically in the smallest doses that will give relief, and never at regular intervals, or the deodorized tincture per mouth in the same way.

I have found in some cases the hydrobromate of hyoscyamine $\frac{1}{100}$ to $\frac{1}{60}$ gr. doses hypodermatically very efficacious. The bromides may be used. Chloral hydrate is, I believe, never indicated in these cases.

HYDROCEPHALUS.

Hydrocephalus may be either congenital or acquired.

Congenital Hydrocephalus.—There seems at times to be a family tendency to hydrocephalus; alcoholism, syphilis, tuberculosis or cachexia in ancestry seem to predispose. It consists of an excessive amount of watery fluid in the ventricles of the brain. As to the immediate cause nothing is known. The fluid is clear, colorless, and contains a small quantity of salts and albumin.

All there is to say in regard to the *Pathology* is that the pressure outward of the fluid in the ventricles causes the brain substance to become flattened and thinned. In severe cases there is scarcely a semblance of brain left—simply a thin sheet or coat between the ventricles and the skull. The size of the head is increased, in some cases

becoming nearly double the natural size. The frontal and parietal prominences are very marked. The fontanelles remain open a long time, the sutures separate, and the cranial bones become very thin.

Symptoms. — Hydrocephalus may develop in utero; if it does, the size of the head will prevent delivery, and death ensues.

It usually develops rather slowly after birth. The main symptoms are the gradual increase in the size of the skull. It will be soon noticed that the skull is increasing in size out of all proportion to the face. The eyes seem to be pressed downward. The veins become prominent, and the cranial bones become thinned, so much so in some cases as to enable one to see dimly the blood vessels beneath it. A vascular murmur may at times be heard on auscultation.

All muscular movements develop late, that is, the child does not stand or walk, use its arms or hands as early as usual. When it does use them, the motions are feeble or irregular. There is often some twitching and at times spastic rigidity. These motor symptoms are practically bilateral, but not necessarily uniformly so. Later the child is unable to sit up or support the head. General spasms often occur.

The mental condition is markedly interfered with, there being very slow mental development, and very little at most. These children are apt to be feeble-minded, even frequently to the point of idiocy. There may be attacks of vomiting and fever. Anomalies, like spina-bifida, hair lip, encephalocele; clubfoot and dwarfism may be accompaniments.

Diagnosis. — In the large head of rachitis the skull is not round, is more square, the fontanelles are not as prominent. The mental conditions are not present. It is possible for rachitis to cause hydrocephalus.

There are rare cases of congenital skull malformations, but there is not the abnormal steady increase in size.

Prognosis. — These children usually die quite soon after birth, although they often live several years and occasionally to old age. In a few cases spontaneous cure occurs, the fluid escaping through the fissures in the cranial bones, into the orbital or nasal cavities, or there may be rupture of the membranes, and it escape through the sutures. Death in a few years, however, is the rule.

Treatment. — The heredity and predisposition should be carefully studied, and a remedy selected on that basis.

None but the deep acting remedies can be of avail. The fluid can not be removed by diuretics or purgatives. Many methods have been advised and tried. To-day we are still without any means of treatment that promises anything.

The steady compression by bandages, adhesive straps or elastic band is dangerous and should not be used.

Surgical measures do not seem to promise much if anything. The drawing off of a small quantity of the fluid from the ventricles at intervals of two or three weeks or more, under the strictest antiseptic precautions is worth trying. The lumbar puncture is of no avail.

Acquired Hydrocephalus.—As to this condition very little is known. It may result from a meningitis peculiar to the ventricles, similar to that which occasionally occurs in the pleura. It may be in such manner as to interfere with the outlet of a ventricle. I doubt whether a fairly certain diagnosis can be made except by lumbar puncture. If we get a clear fluid nearly free from albumin or a salt, it is probably hydrocephalic. Disturbance of vision, choked disk, neuroretinitis and mental dullness, together with irritative motor symptoms are present. It is to be distinguished from acute or tubercular meningitis by the absence of the febrile disturbance of the latter, or its rapidly subsiding and the less severe headache. The prognosis is not so uniformly bad as in the congenital. In this disease the method of prescribing for the patient, rather than for the disease itself is most efficacious. The disease is without doubt primarily due to a dyscrasia. When the result of a pronounced meningitis or congestion, treat the cause.

The only surgical measure that promises anything is either lumbar or ventricle puncture. This seems to offer more hope in this class of cases than in the congenital.

GENERAL PARESIS OF THE INSANE.

Synonyms.—General Paralysis of the Insane, Paralytic Dementia.

Etiology.—Rarely occurs before thirty or after fifty years of age. It is very much more common in males than in females. It is probable that heredity has some influence in producing a disposition for the kind of life leading to the disease. It is more common among the educated and in the so-called higher classes. Close mental application, long-continued and oft-repeated emotional disturbances and grief seem to predispose. Alcohol is an undoubted cause. Excessive sexual indulgence is also to be considered as a direct cause. Clinical experience shows that in a large percentage there is a history of syphilis. Sun-stroke and traumatism may be considered as among the causes.

Symptoms.—The first signs are usually not noticed, till they are remembered afterward. It may be that letters are left out of words in writing, or words left out of a sentence occasionally, or it may be in some other way that a slight mental deviation from the former self is

noted. There will appear in a reasonable time at first very slight evidence of mental weakness, and careful observation will show at about the same time either a motor weakness of some or all muscles, or slight loss of co-ordination. From this time mental weakness conjointly with physical weakness and motor disturbances rather of the paretic type increases steadily. There is apt to be a progressing change in the moral sense. The reasoning powers are gradually lost. Ideas of grandeur, for the most part, although at times hypochondriacal, appear. The patient is very likely to think himself rich or great, to talk about what he can and will do, and it is always something extraordinary. Very many of them even when able to do very little, believe themselves capable of great feats in walking. They nearly always believe themselves strong sexually.

The speech will show dropping of syllables, a drawing out of words, a general stumbling speech, and often a trembling, quaking sound. Fibrillary, tremors of various parts are apt to appear irregularly. The Argyle-Robinson pupil will be present quite early, and in several cases I have observed a peculiar destruction or possibly atrophy of the rods and cones in the eyes previous to any other symptoms. Atrophy of the optic nerve is quite common.

With these symptoms will appear evidences of the involvement of the lateral tracts in the cord.

Through the course of the disease there is likely to occur apoplectic or epileptic attacks, more or less severe, but transient. These attacks seem usually to be followed by marked exacerbations of the whole trouble.

The patient is apt to lose all sense of decency. He becomes an imbecile and dies as a result of broncho-pneumonia, during an apoplectic attack, or may simply go to sleep.

Bed sores and spontaneous fractures are quite common.

Diagnosis. — This disease in the early stage is not infrequently diagnosticated as *neurasthenia*. The eye symptoms here must be the distinguishing feature. If the pupils react very sluggishly, be suspicious. If the Argyle-Robinson pupil is present, it can not be *neurasthenia*. If in addition there is paretic speech, you can be reasonably certain.

The neurasthenic will almost invariably give a clear account of himself which the paretic will not.

If, as is the case occasionally, there is a combination of tabes and neurasthenia, you may not be able to differentiate until the mental symptoms are sufficiently pronounced.

Syphilitic Meningitis may present similar disorders of speech and also similar apoplectic seizures, but the paralysis will not be as

transitory, nor will there likely be entire recovery from the paralysis. There is apt to be neuroretinitis, but not atrophy of the optic nerve.

Arteriosclerosis diffuse will show special localizing symptoms. The speech affection is entirely different, the dementia does not become as pronounced.

Prognosis.— This is bad. I do not think any case reported cured was correctly diagnosticated.

Treatment.— This disease has now become frequent enough to warrant every physician in warning every patient whom he finds living in such manner as to predispose to the disease, and direct him to regulate his life accordingly.

While the patient shows only slight mental feebleness, he may be at home, but close attention should be given to securing the very best hygienic surroundings, and to thorough nutrition. His life must be by rule, very regular in every respect, moderate outdoor exercise if possible.

Later in the case for the protection of the patient, and the best interests of the family, there are but two courses to follow. The first and preferable is to send him to an institution, one that is prepared to take the care of such a case. The other is to place one or two thoroughly competent nurses in sole charge of the patient, and see that his life is regulated like clockwork. This absolute regularity is of vital importance.

If there is a syphilitic base, give the treatment recommended in the chapter on that disease.

Watch carefully for bedsores.

GLOSSO-LABIO-LARYNGEAL PARALYSIS.

Synonym.— Progressive Bulbar Paralysis.

This disease rarely occurs under forty, and most frequently occurs after fifty years of age. There will usually be evidence of a neuropathic temperament. It is much more common in men than in women. It may be the result of exposure to cold, of excessive use of the muscles in public speaking, to excessive mental strain, any marked debilitating influence, or to lead or syphilitic poisoning.

Symptoms.— The first thing to be noticed is usually an indistinctness of articulation, when it will be observed that the greatest difficulty is in pronouncing the lingual consonants l, n, r and t. Later the tongue can not be protruded as far as formerly, and can not be raised in the mouth, and is likely to look wrinkled. The lips are next attacked, become weak, the consonants b, m and p and the vowel o can not be

articulated. Whistling is impossible. The patient begins to drool, the saliva escaping from the corners of the mouth. The disease next attacks the muscles of deglutition and swallowing becomes difficult. First it is hard and later impossible to swallow solids, then liquids; semi-solids are the best managed. Later the lips can not be closed, and the lower part of the face hangs motionless, and is entirely devoid of expression. The upper part of the face has an expression of anxiety and suffering. The whole physiognomy is very characteristic. It becomes almost impossible to articulate at all. The saliva runs freely all the time, and with a nasal whining voice from paralysis of the palate, the patient is indeed a pitiable object. The throat reflex is lost, but there is no anesthesia nor pain. There is a sensation of dryness and stiffness in the throat. In a few cases there is glycosuria and a rapid pulse.

There is no mental disturbance other than an increased emotional tendency shown by crying at every minor thing and frequently.

It is very irregularly progressive, there being remissions of varying duration, but not such as to give any hope of improvement. It usually terminates in from three to four years. The termination is always fatal, usually by choking in an effort to swallow or by inability to swallow. Bronchitis or broncho-pneumonia may intervene and be the immediate cause of death.

It may be the terminal stage of spinal muscular atrophy, or be associated with amyotrophic lateral sclerosis, or with ophthalmoplegia.

Pathology.—The tongue is usually shriveled, but not always; when not, it is owing to the deposit of fat. There will be found signs of degeneration and atrophy in the muscles of the tongue, of the throat and the orbicularis-oris.

The nerve atrophy is like that found in spinal diseases. The nerve atrophy will be primarily found in the nuclei of origin of the hypoglossal, glosso-pharyngeal, vâgus, and spinal accessory; it also invades the raphe fibers and the anterior pyramids. If there are complications, there will be in addition the usual evidences of those complications.

Diagnosis.—This is comparatively simple. The slow onset, the progressive character, the absence of sensory symptoms, the presence of muscular atrophy, and the fact that the paralysis and atrophy are bilateral, are sufficiently characteristic.

Treatment.—From what has been said, it will be fully understood that we know no curative treatment only retardation and amelioration. Quiet of the patient, mental and physical is important, but not to the extent of being confined to the bed. General mild massage and special massage to the parts involved should always be given daily. The gal-

vanic current, the positive pole at the base of the brain and the negative pole to the throat, at both sides of tongue and over motor-points of the other involved muscles using from 2 to 4 milliampères, or from 4 to 6 cells of the ordinary portable battery, twice a day.

The faradic current may be applied daily to the paralyzed muscles just sufficiently strong to produce very slight contractions.

The patient should be thoroughly fed, yes overfed; the character of the food should be semiliquid, and containing the greatest possible amount of nutrition to the ounce. The swallowing should be carefully watched, and if not able to swallow for sufficient nutrition, should be fed in other ways, by oil rubs, by enemata, by the stomach, or it may be necessary to perform tracheotomy and feed through the opening.

As an experiment which I believe promises possibly better results than anything else, is the steady persistent, perfectly regular use of nerve vibration, according to Mortimer Granville, and as found described in Hale's "Practice of Medicine."

As to medicine, I know of nothing that promises the least effect on this disease, even as a palliative.

TREMOR SENILIS.

Definition. — The tremor of old age. It is very common to find aged people suffering from a very uncomfortable tremor, who are otherwise in good health and where no adequate cause aside from the natural degenerative process of age can be found.

To understand this condition aright, we must consider the symptom tremor somewhat. The first principal point to be established is that tremor is only a symptom, and should always be considered as such whenever present, whether in the old or young, or under any circumstances. The next special point is that tremor is perfectly natural, is always present in health, even the most perfect. In health under ordinary circumstances it is intangible, unrecognized. In all muscular action there is a constant alternating of contraction and relaxation, so rapid and well balanced as not to be perceptible to the sense or sight, when in perfect condition. This is automatic and governed by the higher co-ordinating centers, the direct result of the nervous impulse transmitted to the muscle. During the quiescent stage of a muscle its tone is preserved through this same agency, automatically. The entire cessation of this vibration or this rapid alternate contraction and relaxation results in a perfectly placid or paralyzed muscle.

Any disturbance of the originating centers for motion, or of the co-ordinating center, or of the conduction of impulse may result in visible or perceptible tremor. This is fully illustrated in tremor from

powerful emotions, such as fright or excessive joy. It is well known that many people have a more or less general tremor under any kind of emotion, or following excessively rapid or prolonged exercise. The simple act of holding the hand in one strained position, and perfectly still any length of time, will produce a visible tremor. This is also manifest whenever from any cause, as long, wasting sickness, starvation, long continued mental effort or worry, the general strength of the person is materially reduced. The tremor from the excessive use of alcohol is familiar; here there is a decided nutro-chemical change in brain tissue. In such diseases as multiple sclerosis and paralysis agitans, tremor is a prominent symptom, in these again there is degeneration of nerve tissue. Many other conditions might be mentioned in which there is present visible or perceptible tremor either transitory or permanent. But in all of them there is that which will necessarily interfere with the centers or the conduction of nervous impulse. It is always the natural tremor modified by collateral conditions.

Experiments recently made at the Johns Hopkins clearly demonstrate the foregoing and also that the natural tremor may be modified in different ways, may be more or less rapid, or irregular in its rhythm.

Senile tremor is the direct and logical result of the parenchymatous degeneration of old age, whereby the elements of control of the naturally rhythmic alternate contractions and relaxations are interfered with, are weakened.

Symptoms. — There is to this but the one symptom, tremor. It is probably more frequently noticed in the tongue, then the muscles of the neck, then the arms, and later but not frequently the legs. It is at the onset, and for some time, a very fine tremor but later grows more pronounced and of a wider range. It is at first noticed only on voluntary motion and is absent entirely during rest and sleep; later it is present during quiet and sometimes even during sleep. The shaking of the head, however, is the most prominent feature. In this it differs from all other varieties of tremor. It is exceedingly rare for the head to shake in any of the other forms. Close observation will reveal in the other forms that the shaking of the head is only apparent or a result of the body tremor, while in this it is actual shaking of the head itself.

Treatment. — There is no treatment that promises anything, inasmuch as it is not properly a disease, and there is nothing to fear except the inconvenience. Merck's Hyoscyamine (4x trit.) four or five doses per day, will sometimes materially relieve it, and hold it in check for a long time. Occasionally 1-500 grain tablets, two or three times a day will be necessary. In some cases nothing seems to have any influence whatever. Phosphide and valerianate of zinc have been useful in some cases.

SENILE DEMENTIA.

In this condition the mind in its entirety suffers. No matter how widely the different cases may vary in prominent manifestations, there will be in every one of them an unmistakable element of dementia or stupidity. This element of course varies from the slightest and most evanescent signs that can only be obtained from a full, clear history, or from close watching over a period of weeks, to absolute loss of mental power. Gray makes a division into two classes. In the one the mental symptoms alone, the other with a mixture of mental and physical symptoms.

Symptoms. — In the mental class, loss of memory is first noticed. This is very marked for recent events and also for things long past. It is quite apt to be variable, that is, an event may be forgotten to-day and remembered to-morrow, or even in an hour. There may be failure to remember a person or place perfectly familiar. A senile dement may wander over a city or town in which he lives and has lived all his life, with which he is perfectly familiar, all day, without knowing where he is. He is of course very apt to get lost.

Very soon the judgment begins to grow less accurate, less clear, and there is a constant tendency to arrive at erroneous conclusions, or a failure to reach a conclusion at all.

The emotional nature shows a tendency to be in the ascendant, and the patient is apt to break out in violent fits of anger, or to be melancholy or wildly garrulous or hilarious, or to weep freely without cause. The patient becomes erratic and eccentric, may be exceedingly restless, and wander away from home. Delusions are frequent, and may be shifting or fixed. They may be based on hallucinations or illusions, or be independent. The delusions are apt to be of the nature of persecution, the patient imagining that he is being robbed or cheated, or that there is some conspiracy against him, or that his relatives are treating him badly.

Hallucinations and delusions of an optical or aural nature are most frequent; less frequent, but fairly common, are those of an olfactory nature. These hallucinations and delusions are often based on a false perception, through the general senses, or sensations coming through the abdominal or thoracic region. They are like all other phenomena of this senile condition likely to be transitory and shifting, although in some cases they are permanent.

The senile dement is quite apt to be erotic, and many times this leads to unpleasant occurrences. Like other things it is likely to be transitory, but may be permanent.

Bear in mind that the mental symptoms while they may be permanent or while there may be one or two that are permanent, are usually

transitory and shifting from one class to another from day to day or week to week.

In the second class, or those in which physical symptoms are combined with the mental, there may be paralysis to a greater or less extent. It may be a true hemiplegia, that is, including arm and leg of one side and lower part of face and tongue. In these cases the nasolabial fold on one side will be lost, and the tongue when protruded will deviate to one side. With it there may be aphasia, more frequently ataxia. It may be that one side of the face, one arm or one leg, only, is affected, that is, it may be a true monoplegia; or again one muscle only, or one nerve only may be paralyzed. It is rare to have individual nerves except the auditory and the olfactory, although any nerve may become paralyzed. In examining for paralysis of any one of these three nerves, we must remember that these senses are naturally blunted in the old, also that there may be local causes to account for the loss of sight, hearing or smell. If a sufficient local cause exists, you of course can not diagnosticate paralysis of the nerve, even though it may be present. It is almost utterly impossible to determine in dementia the condition of taste, therefore we practically never can diagnosticate paralysis here, although it has been done in a few cases.

Tremor is found present rather frequently, it will usually appear in the following order, but not always: the tongue, facial muscles, and the head and neck; occasionally the tremor may affect the extremities. The speech will be affected as to character and pitch in various ways depending on the form of dementia and physical symptoms.

The *Prognosis* is grave. This disease is likely to run a long, fluctuating course, but in the main getting gradually worse; that is, the mentality grows less and less acute, the stupidity more and more marked, and the physical symptoms more and more pronounced, as months pass.

The chances of any help are less in the cases in which mental and physical symptoms are both present. Some cases, however, under treatment, have so far recovered that nothing but simple senility was present.

Treatment.—The treatment is essentially that mentioned for senility, first and most important thorough nutrition. Besides the ordinary means for accomplishing this, the Glycerophosphates of lime and soda are frequently very useful. A usual prescription is:—

Glycerophosphate Lime
 " Soda ʒʒ grs. 64
 Aqua Distil. q.s. ʒiv.
 Mix in hot bath.
 Sig.

Teaspoonful 3 or 4 times a day.

Conium mac. is one of the sheet anchors in this disease. In mild purely mental cases it should be used in the 30., the special symptoms are hypochondriacal sorrowfulness and sadness with desire for solitude, unsympathetic from indolence. If there is a tendency to half conscious wandering about, an aversion to company, and yet will not be left alone, and alternate excitement and depression, give it in the 3x. If there is steady continued excitement, chilliness and frequent spasmodic movements of different muscles, dread of light, weak sexual power, and frequent pollutions, give the tincture in from two- to ten-drop doses every three or four hours.

Anacardium (30.).—Great weakness of memory; feels as though had two wills; motions awkward and sluggish, indifferent to pleasant or unpleasant things.

Baryta iod. or mur. (3x).—Forgetful, in the middle of a conversation or sentence the most familiar words fail him. Loss of memory, especially for recent occurrences, childishness, irresoluteness, despondency, pusillanimous.

Helleborus.—Obtuseness of the intellect, even to idiocy, reserved, melancholy; stubbornness; great weakness of memory and slowness in collecting his senses; want of power and hesitation to action; want of muscular co-ordination.

Hyoscyamine (Merck's 4x trit.).—Where there is a lascivious tendency, tendency to get into a rage easily, especially if with it there is unusual strength. Objects seem much larger than they are, senseless apathy and indolence; makes no complaints; has no wants, morose and dejected; fear of being poisoned, or of being injured by friends; suspicious generally; excited sexual desires; tremor.

Iodine (3x).—Despondency; oppression of chest: impatient moving about; excessive nervous irritation; trembling and sleeplessness.

Opium (30.).—Fantastical; talks in a confused manner; commits indecent actions; instability and imbecility of will; complete dementia; excessive debility; stupor; frequent sweats.

Secale cor. (2x).—Wandering talk and hallucinations; apathy and complete disappearance of the senses. Nearly always indicated in the paralytic cases.

Zinc phos. (3x trit.).—Repeats questions before answering them; changeable humor; weakness of memory; difficult comprehension; lassitude and depression; fidgety feet.

In this as in all diseases a full quantitative analysis of the 24 hours' urine should be made, and the abnormal conditions shown by it corrected.

SENILITY.

There is a tendency in all wasting diseases, to simple parenchymatous degeneration of nerve tissues, with consequent atrophy. With the general wasting and low nutrition of old age, this same condition is present in a greater or less degree.

There are very few symptoms other than those of general mental and physical debility. It is important, however, to note in this connection that degeneration and atrophy is a pronounced cause of a lowered sensibility and activity in the skin.

That the human being should grow old, and at some time, even under the most favorable circumstances, and always in the best of health, will begin to decline in mental and physical vigor, is natural. There will inevitably come a time when the nutritive processes will wane ; when building ceases, except to replace waste ; when degeneration and decline is natural. This is physiological senility. The parenchymatous degeneration is present, but it is physiological. The age at which this physiological senility begins, and the rapidity of its development varies greatly in different people. That it is within the power of the individual, ordinarily, to retard the time of beginning and the rapidity of the progress, is quite certain.

Like other physiological processes, however, if it appears at an early age, or appears under unnatural circumstances or conditions, it becomes at once disease. If it progresses rapidly after its onset, it is disease. If anything occurs to modify the character of the degeneration, it must be classed as pathological.

Every act of life must have its influence on this final termination. All dissipation of whatever kind, all disease, all sorrows or worries must and do influence and modify the natural decline of life.

It is with abnormal senility that the physician has to deal.

Premature Senility. — This simply means growing old at too early an age. The man or woman, who at forty or fifty years of age, presents marked signs of old age, is suffering from premature senility.

Etiology. — Dissipation, more particularly the use of alcoholic liquor. The use of tobacco does not seem to be particularly liable to produce this condition. Sexual excesses, unless very marked, does not seem to specially predispose, but on the other hand, very marked excess does.

Worry is by far the most common cause. The worry habit, by which I mean the tendency to constant worry, without adequate cause, the constant hunting for something about which to worry, produces the most profound impression.

Excessive physical labor and exposure tend to age more rapidly, while mental work, unless carried to the point that may be termed dissipation, does not seem to. Diseases of various kinds must of course be included as among the predisposing causes. Those affecting the digestive organs or leaving those organs in a chronically deranged condition, most of all.

The symptoms are very variable, that is, while all are just such as naturally come with old age, one patient presents one set prominently, and another, another set. One patient simply shows the general feebleness mental and physical, and presents a general facial expression, far older than his years, while another will have the forgetfulness, markedly for recent events with the retentive memory for things of years gone by and possibly to loquaciousness. Another may simply find his judgment slower, less decisive and less accurate; still another may show the marked physical appearance and feebleness, without the mental signs, or it may be that the tremor is marked and so any one of the signs or combination of the signs of age may be present. The prognosis in these cases must depend somewhat on the causes leading up to it, but in general it may be considered that under the right treatment, which of course must include the right environments, the degenerative process, not only may be arrested, but repair be brought about to a considerable extent. If the patient has had the worry habit for the most of his or her life, the prognosis is not favorable.

Treatment must consist largely in securing the right environments. Here it is the physician's duty to inform himself thoroughly as to everything pertaining to the patient's life. It is the duty of the patient and friends to hold nothing back from the physician. In these cases, no secrets, no family skeletons should be kept in the background. The physician should know the financial conditions and possibilities. Having all this knowledge, it is for him to make a careful study as to how environments can be made to fit the patient and his circumstances. Bear in mind that there will often be things that can not be corrected, but the physician must direct such changes as will place the patient in the best environments possible. This includes the correction by the patient, on the physician's order or request of all pernicious habits. The patient must have suitable food, plenty of it, and also free, pure air, sunshine and moderate physical exercise. This may be by the patient's own exertions or by massage, Swedish movements, moderate physical culture and the like.

A full quantitative analysis of the entire twenty-four hours urine should be made, and the excesses or deficiencies as shown by it, corrected. The patient must have both mental and physical rest, in large

doses; this is very important. In the bad cases I have frequently used the "Wier Mitchell Rest Cure" in its every detail, for a period of four to six weeks, with marvelous results.

The digestion must be looked after very carefully and constantly, and any possible physical source of irritation, removed or corrected. Many times the removal of cicatricial plugs, the repair of a perineum in a woman well past the menopause, or the healing of an ulcer, or the removal of hemorrhoids will be absolutely necessary, in order to bring about favorable results. So in men there may be certain irritating causes to be removed or corrected.

A sufficient amount of sleep is an absolute necessity. This may be accomplished in various ways. He should be required to lie down at least twice during each day and be perfectly quiet. Tepid salt baths, either in the tub, or simply the sponge bath; gentle massage or simple surface rubbing may induce the necessary conditions to produce sleep. Taking some kind of nourishment on lying down or on going to bed, such as milk or some of the many invalid or baby foods or taking a very little stimulant in milk on retiring.

A carefully selected remedy may accomplish the result.

It may become necessary to use some sedative, like the Fluid Extract of Hops; Scutellaria (1x trit.), Glonoin (2.); Strychnia $\frac{1}{100}$ grain alone or combined with digitalis, if a particularly feeble heart. Or you may have to resort to Trional or some one of the more powerful hypnotics. But Sulphonal, the Bromides and Chloral Hydrate are positively contraindicated in this condition, and should never be used.

The remedies for the general condition to be used, or most frequently called for, are Kali phos. (3x to 6x), Calcara (3x to 30.), Strychnia phos. (3x to 6x), Phosphorus (3x), Chinin. arsen. (3x), Chinin. sulph. (2x), Conium (30.), and the Glycerophosphates of lime, soda, or lithia in two-gr. doses three or four times a day dissolved in distilled water.

If tremor is a prominent symptom, the Mercks Hyoscyamine (4x trit.) four to six doses per day.

APHASIA.

In this condition the patient may be unable to express what he thinks or feels in words; may be unable to pronounce words; may be unable to understand words perfectly familiar; may be unable to understand and remember words, but can only express them in writing, or may not be able to express in any way what is seen or heard.

There are many varieties depending on the seat of the lesion in the brain. The principal forms are auditory, motor, visual, conduction and mixed.

Dana suggests the following twelve questions to be asked regarding every case:—

- Can the patient hear sounds?
- Can the patient understand spoken words?
- Can the patient see objects?
- Can the patient see words written or printed and read them silently?
- Can the patient read intelligently?
- Can the patient speak voluntarily?
- Can the patient repeat words?
- Can the patient read aloud?
- Can the patient read voluntarily?
- Can the patient write from dictation?
- Can the patient copy what is written or printed?

Auditory Aphasia. — The first and second temporal convolutions are affected, of the left if right-handed, of the right if left-handed. The patient, although not deaf, is unable to understand spoken language. This is word deafness. The more extensive the lesion, the greater the combination of effects. The patient may not be able to read intelligently, repeat words seen or spoken to him, read aloud, copy written or printed matter, or write from dictation, but may be able to speak of his own accord, intelligently, but will skip words. The patient may have all or only part of these symptoms depending on the extent of the lesion.

Motor Aphasia. — The lesion is in Brocas's convolution. The patient can not speak of his own volition, but is able to read aloud or copy. He understands language either written or spoken. These conditions may be more or less complete.

Agraphia is an inability to express ideas in writing, and is never found except combined with other forms. It is present in greater or less degree in all forms.

Visual Aphasia. — The lesion may be in the supramarginal lobule and cortex of the angular gyrus, when they will be able to see words, but without understanding them. He does understand spoken words. If the lesion is in the subcortical substance of the angular gyrus, the patient will be able to write but not to copy.

Conduction and Mixed Aphasia is from lesion in the island of Reil or near the fissure of Sylvius. The patient is simply, so to speak, word drunk. He may repeat the same word over and over again, or use the same word to express everything, may have only the one word in his vocabulary, or he may mix words up in the most unintelligent and ridiculous manner, and yet can read and write intelligently.

Aphasia is considered as a symptom rather than a disease. It

may be caused by any disease affecting the functions of these special parts of the brain.

In those cases in which there is destruction of brain tissue in these locations, it will remain permanent.

In all cases in which it is possible to restore these centers to proper function a cure can be expected.

It may occur in anemia, or hyperemia of the brain or in hysteria or neurasthenia. In these the prognosis is favorable.

Treatment. In as much as aphasia is never an independent disease, the treatment must be directed to the condition producing it.

II. DISEASES OF THE SPINAL CORD AND MEMBRANES.

SPINAL MENINGITIS.

Definition. — Inflammation of the Membranes of the Spinal Cord.

Etiology. — Spinal meningitis may occur during epidemics of cerebro-spinal meningitis, in conjunction with, or as result of tubercular or purulent cerebral meningitis. It may follow acute infectious diseases. A pus cavity anywhere may be the primary cause. Infected wounds, also sepsis following labor, may induce spinal meningitis. It may result from traumatism, and sometimes follows an attack of otitis.

Pathology. — The pathology is that which is usual to meningitis.

Symptoms. — There is usually a chill, an irregular high fever, severe pain referred to the spine, and a deep, sharp ache aggravated by any motion. These pains are felt along and at the distribution of the spinal nerves. There will be some stiffness and rigidity of the muscles of the legs or arms or both, but more marked in the muscles of the trunk, with a tendency to tonic spasm opisthotonic usually, but occasionally emprosthotonic, and to clonic spasm on attempts at volitional movement. There will be an increased tendon reflex and cutaneous hyperesthesia of the trunk and limbs. Often on account of spasm in the flexors the patient cannot extend the leg while sitting. Frequently there will be incontinence of the urine. Paraplegia practically always follows and with it the tendon reflexes will be marked, and there will be some anesthesia of the lower trunk and legs, and urinary and bowel disturbance causing either incontinence or retention. Heart and respiratory symptoms are very common. It is essentially an acute disease.

Prognosis. — The prognosis is grave. A large percentage of the cases die in a few days or weeks. There may be recovery, but it is very rarely complete; there will remain either the paralytic symptoms or a chronic meningitis.

Treatment. — The patient must be kept quiet and in bed, and should lie on the face or on one side. Cold wet packs should be applied to the spine; if fever is quite high and persistent, general cool packs. If the cold packs to the spine do not seem to afford relief, or seem to cause aggravation, hot wet applications may be employed. At times the spinal ice-bag is very efficacious. In very serious cases it may be well to try lumbar puncture. Look out for bedsores.

Aconite is the remedy at the onset. It should be given in two-drop doses of the tincture of the root, every hour for the first twenty-four hours following the chill. *Bryonia* (3x dilution) every half hour will probably be called for more frequently than any other remedy. It is indicated by the inflammation of a serous membrane, as well as by the symptoms; also if from exposure or in a rheumatic case, *Rhus tox.* (3x) is likely to be indicated. *Iodine* (2x) is a remedy that will also frequently cover both the pathology and the symptoms. If there is a tendency to a long-continued rather low fever, that is, a semiacute stage, *Merc. bin. iod.* (4x trit.) is likely to be the best remedy, also in case there has been a syphilitic history.

In cases from direct traumatism, *Hypericum* tincture in from five- to ten-drop doses every hour, early; later, if a semiacute tendency, *Arnica* (30. dilution) is likely to be called for. *Hepar sulph.* is a remedy that may often be indicated on account of suppuration.

CHRONIC SPINAL MENINGITIS.

This is a disease much more frequently diagnosticated than it occurs. It is a disease of adult life.

Etiology.—It follows at times the acute form. Exposure to cold and damp for a long time is an exciting cause. Tuberculosis, syphilis and alcoholism are all predisposing causes, as is also traumatism. It may result from an extension of myelitis, and is always a concomitant with any compression of the spinal cord.

Pathology.—Irregularly thickened membranes. The spinal fluid is muddy in appearance. There are adhesions between the various membranes in spots.

Symptoms.—There will always be pain along the spine, aggravated by motion, and often extending along the course of, and to the parts supplied by the spinal nerves from the affected part or parts. The spinal movements that cause most pain are those that curve the spine in any direction, most marked laterally. There will be sharp pain on pressure between the spinous processes. There is apt to be some sense of constriction about the body or about an arm or leg. There will be but slight motor symptoms except in rare and very prolonged cases, when there may be some spasmodic action or some paralysis.

Diagnosis.—From *inflammation* of the *spinal nerve roots*, by the absence of special spinal symptoms, and the limitation of the pain, it will be local and extend to a small area only. From *primary lateral sclerosis*, by the absence of radiating pain, and the aggravations from motion. The progress is very different from *hysteria*, first by

the fact that in hysteria, while there may be neuralgic pains anywhere, they do not follow the course of the spinal nerves, nor are they at all confined to the distribution of any one or set of spinal nerves. In hysteria, too, there will nearly always be tenderness to pressure the entire length of the column, which is not the case in chronic meningitis.

Prognosis.—This is, I believe, in most cases favorable, providing both the patient and physician have sufficient perseverance. It is true that some deaths have been reported from the disease, but this is not at all common. The prognosis depends to some extent on the cause.

Treatment.—Rest is all-important. The exact amount of liberty in being about must depend on the severity of the case. It should always, however, be restricted beyond the seeming need. In marked cases the patient should be absolutely confined to the bed, and for a long period of time.

Dry spinal cupping is an invaluable element; it should be given with rather large cups and an exhaust pump. The ordinary little cups will be of no avail. The back where cupped should become markedly discolored. It should be done daily for a period of weeks or months. The galvanic current from five to ten milliamperes, downward current, every alternate day for about ten minutes. This may be followed with advantage, by a rapidly interrupted secondary current, such as is obtained from the ordinary portable hand faradic machines, for about fifteen minutes. The patient should lie on the spinal ice-bag from one to two hours daily. If the case does not yield readily, I use the actual cautery over the spine. I apply it every day or every alternate day. The platinum should be heated to near or quite a white heat, the skin on each side of and near the spinous processes touched very lightly and quickly, the object being not to make a deep burn, but purely of the surface. I make 4 to 6 spots about $\frac{1}{2}$ inch apart on each side; then the next day the same just below these, and so on the full length of the cord. I have in some cases gone over the entire length 3 or 4 times.

Hot baths in which the temperature of the patient is elevated from $\frac{1}{2}^{\circ}$ to 2° , followed by a pack and a rapid surface rubbing, have often been of great use.

Galvano-puncture over the spine may be of service in severe cases.

In the syphilitic cases, the usual remedies indicated by that disease are to be employed. The same may be said as regards internal remedies in tubercular cases.

If traumatic, *Arnica* (30.) should always be used. I am aware that *Hypericum* has been often recommended in these cases; in my hands it has been disappointing. In two cases in which I have used it in the 12¢ dil. the results have seemed more satisfactory. *Iodine* in some

form has been a great aid to me, I am sure. The exact form must depend on the totality of the case. I use it in the 3x to the 30. Gelsemium (30.), Picric acid (30x trit), Zinc picrate (3x trit), Argentum nit. (3x to 30. dil.), Oxalic acid (3x trit.), these are the chief remedies as I have used them.

CERVICAL HYPERTROPHIC MENINGITIS.

This special form is described by Charcot and Joffroy and since by others. It is a thickening of the dura-mater by fibrinous deposit, the result of a chronic inflammation. The word "cervical" should not be included in the name, for while it does usually commence in the lower cervical region, it usually attacks the upper dorsal, and not infrequently even lower portions of the cord. Very little is known as to the cause. Exposure, overexertion and syphilis have all preceded cases, and are probably causative. Syphilis quite certainly is.

I have never diagnosticated a case, although I have the records of two cases which I now am sure should have been so considered. The disease commences with pains in the neck and back of the head with a feeling of tenseness. There are various paresthesias and neuralgic pains in the median and ulnar nerves. This line of symptoms may last months.

This is followed by a disturbance of cutaneous sensation in the area of the distribution of the nerves from the affected portion, incomplete anesthesia being the most common.

There is paralysis of the flexors of the hands and fingers and nearly all the small muscles of the hand. This is a degenerative paralysis. The position the hand assumes is quite diagnostic. The hand is bent backward on the wrist, the fingers partly flexed. Later we may have anesthesia in the trunk and the lower extremities accompanied by a more or less complete paralysis.

It is a disease that may spontaneously arrest itself at any stage. While the prognosis in general is unfavorable, yet a fair proportion of cures takes place.

Treatment. — I would commence with a Spanish fly blister to the lower cervical and upper dorsal region, and repeat it as soon as healing has taken place. From three to five blisters should be applied. This should be followed by the application of the actual cautery over the affected region, going over it three to five times and followed by the galvano-puncture. I prefer a triangular pointed, rather large, platinum needle. Connect this with the negative pole of the battery; apply the positive pole with a large flat electrode over the upper lumbar spine; use a current gradually increased to ten to fifteen milliamperes; then gradually decrease to 0, occupy about forty seconds to each puncture;

make one puncture about one eighth to one fourth of an inch deep on each side of the upper spinous process at a sitting. The following day opposite the next process, and so on. This may be continued daily for four or five months if need be.

Iodine is the great remedy for this condition. I advise *Kali iod.*, in gradually decreasing doses, commencing with five-grain doses four times per day, for one week; the following week three-grain doses and the following 1-grain. Then the 2x, the 3x, the 6x, each successive week. If on careful analysis, mercury seems the better indicated, give *Merc. iod.* (3x trit.) every two hours. Stick to your remedies for months. You cannot expect decided results soon.

SYPHILIS OF THE SPINAL CORD.

It is not the intention here to include the diseases of the cord caused by syphilis, but simply certain ones in which actual syphilitic processes take place in the cord. These nearly always, it is probable, first attack the membranes and frequently extend into the cord itself. On removal, the cord will seem to be much enlarged. In making an effort to separate the membranes, adhesions will be found preventing the separation in many places. There will appear many and irregularly distributed spots of various sizes, of a fibrous or jelly-like appearance. On opening the cord, there will be found irregularly distributed soft grayish deposits.

On examination with the microscope, there will be found places in which there are deposits of cellular tissue, well supplied with blood vessels, and other places where the membranes are thin, hard and dry. These abnormal spots do not take in the entire circumference, nor are they at all regularly arranged in any way.

The spinal roots may be infiltrated or softened in spots. The blood vessels are obliterated by thickening of the walls. There may be an occasional case with simply an isolated gummy tumor.

Rarely there may be a poliomyelitis or a diffused myelitis.

Symptoms appear in from a few months to six years after infection. A short review of the general characteristics will enable the physician to make a diagnosis. One cardinal point must always be kept in mind—all the symptoms of syphilitic meningitis will be constantly better and worse. The changes often take place rapidly; one symptom may be very bad to-day and gone to-morrow and present again the next day or week or month. This is true not only of the subjective, but of the objective symptoms also.

Pain in the spinal column with radiating pains from it, irregularly distributed paralyses and monoplegias occur. The paralysis may be

flaccid or spastic. The functions of the bladder and rectum will be interfered with. Irregularly distributed sensory functions, either hyperesthesia, anesthesia or paresthesia are likely to be present.

Some cases so clearly resemble tabes that Oppenheim calls them syphilitic-pseudo tabes.

The cauda-equina may be involved; if so, there will be neuralgic pains and sensory symptoms in the parts supplied.

Diagnosis. — This must be made by the fact that there is evident organic cord trouble, but not complete as to the essential elements of any well-defined location or pathology, and by the irregularity of its course. Of course, there must have been syphilis contracted. It is possible, however, to have a hereditary spinal syphilis.

Treatment. — The treatment is as indicated in the chapter on the treatment of syphilis.

MYELITIS.

Definition. — Inflammation of the spinal cord. We do not now, as formerly, include all the inflammatory conditions of the cord under this head, but only those cases in which there is a diffused inflammation with softening.

Several forms of myelitis are recognized dependent upon the part of the segment or segments involved.

Etiology. — Cold, muscular strains, traumatism, sexual excess, syphilis, toxemia, smallpox, typhoid or typhus fever, inflammatory rheumatism, diphtheria, occasionally scarlet fever, and septic puerperal conditions are causes of this disease.

Pathology. — At the seat of the inflammation the cord will feel soft. It will be of a grayish-yellow color on section. The gray and the white matter seem to run together. There will be seen under the microscope a number of granular cells, swelling of the axis cylinders, and proliferation of the neuroglia.

Acute General Myelitis is almost always ushered in by a distinct chill, followed immediately by severe abdominal pain accompanied with rigidity of the abdominal muscles. The temperature rises rapidly to 103° or 104° F. The pulse increases in frequency in proportion to the temperature; it may be hard and tense or soft. There will usually be great mental agony. Heat applied over the spine will nearly always aggravate the pain in the abdomen. The urine is retained and soon becomes ammoniacal or alkaline; later there may be incontinence, but without the bladder at any time being completely emptied. This causes the urine to continue to be alkaline. The bowels are usually constipated. There may later be incontinence here as well.

In a very short time paraplegia will be present, preceded by pains in the legs and evidences of motor irritation for a short time only. The paralysis is of the flaccid type.

The tendency is for the inflammation to extend upward, when the respiration and the heart action are likely to be interfered with and death ensue. I know of no condition likely to be mistaken for this sudden, rapidly developing malignant disease. If the patient is so fortunate as to live through this very acute stage, we then have to deal with it as with the ordinary forms of myelitis, or we have following a chronic myelitis.

Treatment. — Active measures must be resorted to at once. Ice should be applied constantly over the affected portion. The galvanic current, fifteen to twenty milliamperes, downward, the positive pole above and the negative pole below the inflamed portion, should be applied for five minutes at a time at least once an hour.

If in twelve to fourteen hours the disease seems to be still progressing a Spanish fly blister should be applied over the entire length of the inflammation, and, of course, properly and carefully dressed after.

If the pulse be hard, tense and rapid, give Norwood's tincture of *Veratrum viride* as suggested under acute cerebral meningitis. With the softer, yet tense, full pulse, give *Aconite*, tincture of the root, one to three drops every half hour till the pulse is materially lessened. If there is a very rapid, soft pulse give *Aconite* (3x dil.), every fifteen minutes. In those cases in which signs of paralysis occur very early, that is within a few hours, *Squibb's Aqueous Extract of Ergot* hypodermatically, ten minims at a dose and every half hour or hour. *Gelsemium* tincture in three- to five-drop doses every half hour to hour or *Calabar bean* tincture in from five- to eight-drop doses, or the two may be alternated in cases where paralytic symptoms with signs of irritation appear.

As soon as the progress seems to be arrested and the immediate danger averted, the case is to be treated as an ordinary acute myelitis.

The usual form of myelitis commences with a dull or a sudden paralysis with high fever. The patient will feel a weakness of the legs, more or less numbness (formication), and later an increasing inability to use the legs in any way; anesthesia of the legs, with the motor paralysis, some difficulty in voiding urine, and some disturbance of the bowels is nearly always present. There is very little pain. The disease may be quite acute, subacute or chronic from the start.

The first evidence may be simply a sensation of weakness in one or both legs, with paresthesia and later anesthesia. With the motor weakness there will be some stiffness. All these symptoms gradually

increase, until some point is reached, which may be a complete paraplegia, and paresthesia.

Dorsal Myelitis.—Paraplegia usually spastic. The legs may be extended or flexed, or alternate extension and flexion. The knee jerk, unless interfered with by the spastic element, is increased. There will be anesthesia from the level of the lesion down. At the upper border of the anesthesia, there will be a narrow band of hyperesthesia, and a sensation as if a girdle were bound about the body. The superficial reflexes are usually exaggerated. Sensation in the rectum and urinary organs is destroyed, and all control lost so that there may be suppression or incontinence. Bed sores are very common. There is very little atrophy except from non use.

Lumbar Myelitis.—Paraplegia, muscles relaxed, soft, flabby, knee jerk and superficial reflexes absent. The paralysis of the rectum and bladder is very marked. The anesthesia also. There is no girdle sensation except sometimes in the legs. There is likely to be sharp pains along the course of the nerves into the legs.

Cervical Myelitis.—If in the upper cervical region, there will be a spastic paraplegia of the arms, without atrophy with anesthesia of the muscles of the trunk, of the diaphragm and of the legs. If in the lower portion, there will be paraplegia of the arms, with flaccid muscles, anesthesia and atrophy, also a spastic paralysis of the arms and legs, with anesthesia, but without atrophy. Paralysis of the trunk muscles is also present, causing interference with the respiration.

Incomplete Transverse Myelitis.—If only, as is sometimes the case, a portion of the segment is inflamed, and not the entire cross section, we simply have those symptoms due to the part affected. The symptoms as described will be present only in part, and be incomplete.

Disseminated Myelitis.—Following acute infectious diseases or as a result of toxemia, we sometimes have a number of small areas of the cord affected with inflammation. Usually the brain is also involved to some extent. It is impossible to describe a case of this kind. There will be present the certain signs of the characteristic interruption in the functions of the parts inflamed.

Prognosis.—In the acute stage the prognosis is grave, first as to life, next as to arrest or complete recovery. Some cases have made a complete recovery, but always promptly if at all. It must be remembered that once there is absolute destruction, the destroyed cells or fibers cannot be replaced, and the functions of course cannot be restored. There is no doubt, however, that many cells are simply congested, and these may be restored to function. Many fibers are simply interfered with by inflammatory deposit; this may be absorbed

and function restored. Cases of gonorrheal origin usually recover. Those following acute infectious diseases are likely to recover. A permanent paralysis is quite likely to be present. Cystitis is a danger to be very carefully guarded against. An early rapidly developing bed sore is of serious portent.

Treatment.— The first thing is absolute quiet as to movements. The patient should not be taken out of the bed for anything, not even movements of the bowels or urination. Great care must be taken however, as to cleanliness in this regard. The region of the scrotum must be carefully protected from irritation by the urine. This may be accomplished by using a urinal, or by the use of absorbent cotton. The bed clothes under the patient must be absolutely free from wrinkles or humps, to help prevent bedsores. If possible to procure a water or air mattress, it should be done. Water or air cushions should always be used under the lower portion of the spine. I do not advise in the early or acute stage of these forms the use of any counter-irritation. I am sure it is liable to do more harm than good. The galvanic current to the spine, the positive pole above the upper border of the lesion, and the negative at the lower end of the spine, from three to five milliampères, or from six to ten cells of the bichromate of potash portable battery should be employed. The current may be applied two or three times per day, about ten minutes each, for the first week with benefit.

The internal medication is very frequently suggested by the cause.

If syphilitic, *Merc. iod.* (3x) or *Merc. sol.* (2x) or *Kali iod.* (3x), or possibly the crude. If from exposure, *Gelsemium* tincture, *Aconite* (3x), *Dulcamara* (3x) or *Hypericum* tincture.

If the result of infection from acute diseases, *Arsenicum alb.* (3x), *Quinia sulph.*, small doses of the crude or the 1x or 2x trit. In the balance of the cases, *Arsenicum alb.* (3x), *Cuprum acet.* (3x), *Merc. iod.* (3x), *Merc. sol.* (2x), *Kali iod.* (3x), *Calabar bean* tincture in from 3 to 5 drop doses every hour or two as indicated. In the chronic stage, the cutaneous surface over the spinal column should be painted daily with equal parts of iodine and arnica tincture. Here the dry cupping will be valuable. It is my custom in these cases to use the dry cupping thoroughly, daily for two to three weeks, following it with iodine and arnica painting, in conjunction with spinal extension, which I am sure has proved of great value in many cases. The specific directions will be found under locomotor ataxia. I continue this line of treatment two or three weeks, then I again use the spinal cupping daily in conjunction with galvanism on alternate days. I commence the use of the faradic current, one pole over the spine with a large flat electrode, apply the

other pole over various motor points of the paralyzed parts in the flaccid paralysis, of sufficient strength to produce slight contractions, and in the spastic cases a mild current only. This is to be given on alternate days, each sitting to last twenty to thirty minutes depending on whether the legs alone or the arms and legs are implicated. Later in the case I have used with benefit the electric brush over the anesthetic parts.

In the chronic stage the one great remedy is strychnia sulph., hypodermatically, $\frac{1}{10}$ gr., three or four times per day and continued for a considerable time.

Neither the patient nor the physician should become discouraged but should persevere for months, yes, even years.

SENILE PARAPLEGIA.

Dimange describes a paraparesis, that is, an incomplete paraplegia, occurring in quite old people, and considers it as the result of arteriosclerosis, similar to that occurring in the brain. There is not always a tendency to assume a spastic form. There may be present a tremor resembling somewhat that of paralysis agitans, but not typical.

ABSCESS OF THE SPINAL CORD.

This disease may be mentioned as a possibility. It has not been my fortune to see a case. It cannot be positively diagnosticated until the post-mortem, which is sure to follow. It may result from traumatism, purulent bronchitis, gonorrhea, or abscess of the prostate.

There will be some symptoms of meningitis, and very soon the ordinary chills, changes in temperature, high and subnormal, zones of anesthesia and paralysis. These latter symptoms indicating a cord lesion, and the formation of pus will arouse a strong probability of spinal cord abscess.

TUMORS OF THE SPINAL CORD.

Nearly any variety of tumor may invade the spinal canal. They may be outside of the dura, between the dura and pia mater, inside the pia or in the cord proper. They may develop in the cord, or form a nest in the cord. There may be only one, or there may be many.

As to the *etiology* aside from the syphiloma, the congenital and the parasitic, little is known. It is quite probable that traumatism plays an important part in the causation.

Pathology.—Are most frequent in the dorsal region and the cauda-equina, but may appear in any part. The substance of the cord is not usually altered, the symptoms being entirely due to pressure.

Symptoms. — Nearly always the first symptom will be unilateral or bilateral, gradually increasing neuralgia along the course of a single spinal nerve, most frequently, of course, intercostal. This pain becomes exceedingly sharp, and after a short time has distinct remissions, then becomes continuous again with times of decided aggravation.

This stage may last many months without new developments.

The later developments will depend on the location of the tumor. There is likely to be a zone of anesthesia, or possibly of hyperesthesia. There will also be evidence of irritation in the motor area supplied by the affected part. As the tumor grows, the anesthesia and irritation will increase in area. If there are a number of tumors, there will be this set of symptoms varying in intensity, from each point of lesion. Later we get the signs of compression. These will consist of a gradually increasing paralysis in the parts supplied by the spinal nerves involved, and usually some spastic paralysis in the parts below. The paralysis may be of any form. Very frequently it is a monoplegia affecting only one group of muscles. The course is not one of steady progression, but nearly always has distinct remissions. The paralysis at the start is usually unilateral, and later becomes bilateral. When the paralysis is unilateral, there will usually be hyperesthesia of the opposite side from the seat of the tumor downward, and anesthesia on the same side.

The rectum and bladder are affected early, first an urgency, then incontinence or occasionally retention.

The Diagnosis and Treatment. — Now that surgical interference is found to be feasible, and to promise perfect cure in so large a number of these cases, the diagnosis assumes great importance. Any case presenting symptoms such as described should at once be examined by a specialist. If tumor be diagnosticated, an operation for removal should be performed at once.

Syphilitic cases must have regular antisyphilitic treatment such as prescribed for tumors in the brain.

HEMORRHAGE IN THE SPINAL CORD.

Synonyms. — Hematomyelia, Medulli-spinal Apoplexy. Hemorrhage may be in the cord or in the membranes. It is exceedingly rare in the cord, and not frequent in the membranes.

Etiology. — I believe, except when the result of some inflammatory process, or of tumor, conditions that have no clinical interest, that a hemorrhage in the cord or membranes presupposes weakened coats of the blood vessels. Traumatism and excessive physical exertion,

especially in conjunction with great excitement may be an exciting cause.

Pathology.—A clot, which undergoes the same changes as in cerebral hemorrhage.

Symptoms.—At the onset there is a sudden paralysis, usually a paraplegia, with severe pains in the spine, which subsides in a few hours. The paralysis may, however, be a monoplegia or a spinal hemiplegia. There will usually be sensory symptoms as well, they may be of any type, depending on the extent and location of the clot. The reflexes may be abolished or exaggerated. There will be some febrile action in the course of a few days, but not severe unless there are complications. If the hemorrhage is extra dural, the onset of the paralysis will not be as immediately complete, nor is it as likely to be of a single type. It is much more likely to be paraplegic. There will be the severe pain in the spine, but extending into the legs, and accompanied by muscular twitching and jerking. There will be early signs of irritation of the nerve roots. The girdle sensation resulting from compression of the cord is quite common.

Prognosis.—If in the substance of the cord, the results depend largely on the location and the size of the clot. If in the dorsal region, better results may be expected than if in either the cervical or lumbar regions. If high, the medulla may be involved, or there may be secondary inflammation, and death inevitably results.

There will always be, unless secondary inflammation occurs, a partial restoration of motion and sensation, but rarely an entire cure. These cases do not often live many years after. The early appearance of bedsores is a grave indication.

Diagnosis.—In poliomyelitis, fever precedes the paralysis, there is no spinal pain, hyperesthesia or anesthesia. There are no bladder or rectal symptoms, and no tendency to bedsores.

In *myelitis* the paralysis is never instantaneous, the fever while it may be absent is usually high previous to and during the first few days of paralysis. There is little if any hyperesthesia, while anesthesia is early and marked.

In tumor, we have the pain local and radiating first, and then a slowly developing paralysis, both as to motion and sensation.

Treatment.—Absolute quiet in bed for three or four weeks, lying on the side or face is imperative. A water or air mattress is best. A hypodermic injection of Squibb's Aqueous Extract of Ergot, ten to twelve minims, should be administered immediately. If there appear evidences of extension showing a continuous hemorrhage, the dose may be repeated in fifteen to thirty minutes. Watch carefully for bedsores

and cystitis. Avoid coughing, sneezing and the like, and all motion as far as possible.

After the first symptoms have subsided, and the paralysis begins to improve, the case should be treated the same as a chronic myelitis.

GLIOSIS AND SYRINGOMYELIA OF THE SPINAL CORD.

These two conditions are practically always together.

Etiology.—A predisposition, trauma, hemorrhage in the cord. Gliosis is neoplastic process in the gray matter of the cord, degeneration of this neoplasm causes the cavity, which is the syringomyelia. Cavities may be formed by the degeneration of tumors.

Pathology.—On removal, the cord is larger than common, particularly in the cervical region. Make a cross section and often a distinct cavity will be found, or there may be what appears to be a tumor. In this, however, examination will disclose at some place a tumor. Under the microscope we find the tumor to be composed of glia cells and glia fibers.

Symptoms.—The cervical region is usually the seat of the trouble. We have an atrophy beginning in the hands, it may be only one, more commonly both, the atrophy is first noticed in the small muscles of the hand. The atrophy then progresses up the arms and shoulders and at times even the muscles of the upper part of the trunk are affected. The hand very closely resembles that of spinal progressive muscular atrophy, and could easily be mistaken for that disease. The electrical reaction of degeneration will be found in individual muscles. There will be incomplete anesthesia of the affected parts. The ordinary sensations are intact or nearly so; the sensation of pain and of temperature will be much lessened. Owing to vasomotor and trophic conditions, the patient is likely to have very slowly healing wounds, because of his inability to detect pain or heat. Vesicles leaving slowly healing ulcers are quite common. The bones are likely to become very brittle, and as a consequence fracture easily, and do not unite well. Various trophic disturbances of the joints frequently occur.

There are cases in which the lesion is in other locations and the symptoms may differ as to location, but not as to character.

Diagnosis.—While a diagnosis cannot be made with certainty early in the case, I think there will never be much difficulty after it has developed. The absence of an exaggerated knee jerk, the peculiarities of the sensory symptoms combined with the trophic disturbances, are sufficiently characteristic.

Prognosis.—It will run a slow, tedious process of gradual progression as a rule. It may last even twenty or twenty-five years. Some

cases seem to arrest spontaneously, and remain just at that point. I consider recovery, impossible.

DIVER'S OR CAISSON DISEASE.

Men working under water in a diver's apparatus or caisson, where they are in an atmosphere of four or five times the normal atmospheric pressure, are liable to either a cerebral or spinal paralysis.

Almost at once on leaving the caisson, he will be somewhat dizzy, feel weak, and have a sensation of heaviness in the head, with a roaring and buzzing in the ears. In a short time, a half an hour or a few hours, the symptoms having gradually increased, he becomes paralyzed; usually it is a spastic paraplegia with anesthesia; and incontinence of the urine; in some cases there is retention. If the paralysis is not pronounced, the patient may make a spontaneous recovery. If it is severe, death practically always results.

Divers should always be cautioned against coming into the ordinary atmosphere too abruptly. Provision is nearly always made, by which they change from one pressure to another by steps, thus obviating the risk in a great measure. The treatment best adapted is galvanism, faradism and massage at once and persistently.

DISEASES OF CAUDA EQUINA.

Etiology.—Traumatism of various kinds, extension from disease of the sacrum or lumbar vertebræ, from meningitis, or syphilis.

This extension of the cord may be affected in whole or in part.

If entire, there will be a complete atrophic paraplegia and paresthesia, with loss of sleep and superficial reflexes. The bladder and rectum will be implicated. If the ilio-inguinal and ilio-hypogastric regions and the testicle retain sensation, the upper lumbar nerves are not involved. If the crural and obturator regions are not affected, the lesion is below the third lumbar. If there is simply paralysis affecting the rectum, the bladder and the sexual functions, and anesthesia of a small patch corresponding to that portion usually covered by a double thickness in making cavalry or riders' pants, the lesion is below the second sacral root. If only paralysis of the levator ani, and anesthesia of the coccygeal region is present, the coccygeal nerve alone is affected.

Oppenheim, as far as I know, first distinctly describes disease of the filum terminale. He says it presents the following symptoms: Paralysis of the bladder and rectum, loss of the sexual and achilles reflexes, and "riding pants" anesthesia. Pain is likely to be an early

symptom of either of the above. The prognosis is fairly good. In most cases the recovery is complete, in others incomplete, but with no tendency to progression.

Treatment. — Surgery has and can do much in these cases if they are of traumatic origin. If syphilitic, the ordinary treatment is quite likely to be efficacious. Other cases require massage, electricity and appropriate remedies. Strychnia $\frac{1}{6}$ grain doses four times per day will often do wonders.

CONCUSSION OF THE SPINAL CORD.

Severe jars of any kind or a hard blow on the back may produce very serious injury, without any discoverable anatomical change. This may be an acute condition, severe symptoms appearing at once, when the eyes will be sunken and dull, without expression and staring. The extremities will be cold, also the hands and feet. The mind clear but somewhat dulled, and the temperature subnormal. No actual paralysis is present, but there is feebleness of motion and decreased sensation to touch and possibly to pain.

In other cases, the symptoms appear a little time after the accident, and progress very slowly. Most frequently, in my own experience, there is first a general bruised feeling and lameness, which is attributed to the accident, without any thought of future trouble. If no special evidence of external injury is found, and there is with these usual symptoms, an excessive malaise and an absence of hysterical or emotional conditions, there is a strong probability that the evidences of concussion will appear later. There will be a general feeling of lameness, weakness on walking, the legs will feel trembly, there may also be noticed a weakness in using the hands and arms, with neither an intention nor a rest tremor, but an irregular tremor from the least excitement or overuse, when attempting to use the limbs or to write or do anything. A very little rest or continued unemotional effort will soon quiet it entirely. With the tremor there is likely to be occasional sudden jerking of one or more muscles causing single very exaggerated motions. The sensation will be dulled as a rule, their flexes present but weakened, a feeling of general prostration, and the eyes somewhat hollow and dull. The progress is slow and never becomes either a motor or sensory paralysis.

I have seen a few cases in which spinal pain and irregular neuralgias were present. There is likely to be some vasomotor disturbance. If constipation is present, it is, as a rule, a previous habit and not the result of the concussion.

The reflexes are normal or slightly reduced.

The *prognosis* except in the very acute cases is favorable. Occasionally a case dies soon, and without apparent cause either before death or at the post-mortem. The disease is usually of long duration, requiring months or years for complete recovery.

Diagnosis. — The entire absence of convincing evidence of organic lesion is sufficient to differentiate concussion of the spine from the organic lesions.

There are a great many damage cases in which a claim of spinal concussion is set up. In these a very careful examination must be made, and not simply one, but the patient must frequently be under observation, and for some time. In the feigned cases, they rarely if ever fail to have some symptoms entirely incompatible with this or any other disease. They nearly always present some symptoms of several diseases; hysteria and neurasthenia may take this form as they may that of any other disease, but will not usually be hard to distinguish from the history.

Treatment. — Rest, galvanism, faradism, spinal cupping, massage, are all useful. They are to be administered as in chronic myelitis.

Here *Hypericum* tincture, five- to ten-drop doses early, or the 12. later, is a very valuable remedy, and frequently gives decided and rapid results. *Arnica* (30.) is another remedy that can be relied upon in these cases. *Strychnia sulph.* (30x) may be called for. *Oxalic acid* (2x trit.) has in my hands done valuable service. *Zinc picrate* (3x trit.) and *Picric acid* (3x) are frequently indicated.

REFLEX SPINAL PARALYSIS.

Occasionally in conjunction with disease of the kidney, bladder, rectum or genital organs, there will appear an incomplete paraplegia, closely resembling a chronic myelitis without actual destruction of the cord structure. It is a question whether, in these cases, we do not have what may be termed the congestive stage of a transverse myelitis. A neuritis may be set up reflexly from injury to the legs or feet or from diseased joints or bones, by extension, by transfer of sepsis or by transmission of irritation.

In this same connection I will simply call attention to paraplegias of a comparatively transient nature occurring after a prolonged diarrhea or a severe hemorrhage. They are without pathological cause so far as we know to-day. They may be caused by anemia of the lower portion of the cord.

The *diagnosis* will depend on the history and the absence of the essential features of organic paraplegia.

The *treatment* must depend on the character and location of the irritation. The first effort in the treatment should be the removal of the irritation, whatever it may be, simple circumcision has cured cases promptly. The cure of a cystitis or an inflamed joint, likewise, has been followed by rapid cure. In the cases in which an inflammation has extended into the cord, we have a myelitis; even though it be slight; it requires the same treatment as that disease.

In those cases following diarrhea or hemorrhage, absolute rest and thorough nutrition are essential. In these cases spinal cupping and heat treatment are contra indicated.

The paraplegia is treated as in myelitis.

PERIODICAL PARALYSIS OF THE EXTREMITIES.

A condition in which, with more or less regular periodicity, a transient paralysis of the legs and arms, lasting only a few hours, has been noticed by a number of clinicians. Some of them seem to be of malarial origin, others do not. There is of course a something in the general system that produces them; what it is we do not know. The only rational treatment is the prescribing for the patient; that is, in afflicting a remedy to the patient, without special reference to these special symptoms.

POSTERIOR SPINAL SCLEROSIS.

Synonyms.—*Tabes Dorsalis*, *Progressive Locomotor Ataxia*. This is a disease on which much has been written. Very few physicians have failed to come in contact with it. The laity are somewhat familiar with it. All dread it

I shall not undertake to give anything more than sufficient data for diagnosis and treatment.

Etiology.—Nearly all authorities agree that the one great cause is syphilis; most authorities claim that it never occurs in a patient who has not had syphilis. My own experience would not warrant such a statement. I started with a firm belief many years ago in this exclusive etiology. I have made the most careful inquiry and examination for evidences of this disease. In fully one third of the cases I believe I have been able to establish as a fact the non-existence of syphilis, either acquired or hereditary. In a small percentage of cases I have been in doubt as to a syphilitic history. In the balance of the cases there has been no doubt of a previous syphilitic infection. I desire here to enter a protest against this universal condemnation of a patient suffering from this disease.

The anatomical changes are not those of syphilitic infection. In those cases in which there is a history of syphilis, the initial evidences are usually very slight. In many of them it has been impossible from a description of the initial sore, to determine its character. Secondary symptoms in a large portion of the cases are entirely wanting. It rarely occurs in less than ten years after the initial attack of syphilis and often not for fifteen to twenty years after. According to the best authorities of this day, it is in these cases, caused by a toxin, that either is an unknown toxin in syphilis or may be generated by it. Traumatism of a sufficiently severe nature has preceded many cases. There can be no doubt that some cases are the result of exposure to cold and dampness. I have seen two cases in which I am sure lead poisoning was the prime factor. Ergot will produce a non-progressive, but essentially an identical pathology. True tabes does not occur in children, and rarely if ever after fifty years of age. It is a disease of middle life.

Pathology. — The cord may, on casual observation, appear normal. In most cases it will be somewhat flattened posteriorly and have an unnatural hard feeling to the fingers. The pia mater may be somewhat thickened and adherent in spots. The changes in the cord are confined mainly to the posterior column, and most frequently in the dorsal and lumbar regions. The posterior horns are sometimes implicated, the posterior roots undergo atrophy to their ganglia. It has been suggested that the disease begins in the (neurones) cell bodies of the ganglia of the posterior roots.

Under the microscope we find in the affected part the walls of the blood vessels thickened, an increase of connective tissue, and decrease of nerve fibers.

Symptoms. — The patient, as a rule, first notices slight weakness in walking and some stiffness in going upstairs. He may notice nothing more for a long time, possibly two or three years, and this he attributes to fatigue or to simple weakness. An attack of double vision lasting a few days or weeks, often occurs. This symptom is quite likely to recur at various times. During this time he is likely to have occasional attacks of gastralgia, and often there may be occasional rheumatic pains. These symptoms not infrequently lead to the patient's being treated for gastralgia or rheumatism. If in these cases the knee jerk is tested and found very much reduced or lost, or the reaction of the pupils is tested and found much reduced or lost, there must be a strong supposition of tabes. The next symptom most frequently noted is the peculiar ataxic pain; not all cases have this symptom, and I am simply not able at present to assign any satisfactory reason. It is

a peculiar sharp, stinging pain, very sudden, lasting a few minutes or hours, confined to a small area, usually some place on the leg. It may be anywhere on either leg, from the hips to the toes, occasionally in the scrotum. It usually leaves for a short time, a slight cutaneous hyperesthesia. There is usually a feeling on the part of the patient that he does not want the spot touched while the pain is present. This pain is simply excruciating. These pains come in groups, as a rule; there may be one or a number of attacks during a single twenty-four hours, or for a number of days, even weeks, and then an entire absence of them for a long time. They may never appear twice in the same place, or they may select a certain spot and appear nowhere else for some time, and then select a new spot. In short, they are very erratic in every respect, except in their intensity.

The next special symptom is the inco-ordination in walking. Most commonly the patient notices that he is inclined to be a little irregular in his steps in the dark. Patients living in a city or well-lighted town may not specially notice the symptoms till the inco-ordination has progressed to a considerable degree. He is now quite likely to notice that in washing the face, leaning over the washbowl and covering or closing the eyes, that he needs to steady himself against something. There will now appear a feeling on the bottoms of the feet as though there was a cork or rubber sole. He does not describe it as a loss of sensation, nor as a numbness. The characteristic gait is now observed. The foot and leg movements are slight at first, later markedly exaggerated. The foot is brought down with a jerk and flat. He keeps the eyes fixed on the floor or sidewalk. If he looks up or around in any way, the gait is more unsteady. On crossing a street or in a crowd he finds himself a little unsteady on his legs. He soon learns that he can not be quite certain as to where he is going to place his foot, without the aid of the eyes, or if the attention is detracted from his walking. He then has to use a cane and still later often two canes. Whether sitting, lying or walking, every voluntary movement he undertakes to make with either leg is very exaggerated. He will usually be able to finally place the leg or foot in a desired place, but it is after a series of exaggerated movements in various directions. Later in the case inco-ordination appears in the arms. He will reach for a pepper box at the table, for instance; he will overreach or reach a little to one side, and then get it all right. Here again he soon finds he must use his eyes in order to accomplish desired movements. The arms finally may become as bad as the legs, so that for instance, if he desires to wipe his face with a handkerchief, the hand will go in all directions in wide circles or angles, and finally to the face.

After this the sight is quite likely to begin to fail and not infrequently blindness occurs. The inco-ordination then is pitiable indeed, the patient being absolutely helpless and suffering unspeakable torment from the pain. The mind may very late become somewhat affected, but is not at all a special feature of tabes. It may be perfectly clear and active to the end. It is essentially a chronic disease, may last from ten to thirty years. A great majority of the patients die from some intercurrent trouble. All cases do not run the same course, other centers and tracts of the cord may become involved, or there may be concomitant brain involvement. These of course will modify the symptoms by adding new ones.

The examination of these cases needs, possibly, some special attention. First examine as to the pupillary reaction: Do the pupils seem to remain the same size under all conditions? Is the reaction of accommodation absent? Is there an *Argyll-Robertson pupil*? If these questions are answered in the affirmative, the presumption will be in favor of tabes; if not, against it. The ophthalmoscope should be used; if atrophy of both optic nerves be present, there may be tabes.

The next step should be the testing of the knee jerk. If this is present, the probabilities are against tabes. Other tendon reflexes are often absent as well.

If a case presents even without any of the peculiar pain, or inco-ordination, having the Argyll-Robertson pupil, the optic nerve atrophy, and the knee jerk absent, it is practically certain that tabes has commenced. Any one of the conditions is enough to cause strong suspicion. A girdle sensation about the body at some point is frequent.

The cutaneous sensations should be next tried. At times very early in the case zones of anesthesia will be found, not only on the soles of the feet, but in various parts of the legs. There will usually be found very little pain on pricking the legs with a sharp instrument. (Analgesia.) Paresthesias of various kinds are usually present. Now have the patient stand erect with the feet together and blindfold him, there will be a swaying motion, and in an advanced case he may even fall. Have him keep the eyes closed, and raise one foot, he will be unable to balance himself on the other foot. Having had the patient walk and having observed the gait closely, now have him walk with the eyes closed. If able to walk at all, it will be with a much more marked ataxic gait, and very irregularly. Have him try to place one foot on a given spot, or on the rung of a chair, first looking, then with the eyes closed, and note the difference in his manner of doing it. In the typical ataxia, the foot will overreach the spot or be raised above the rung, stop or nearly so, and then go to its destination with a jerk.

The co-ordination of the upper extremities may be tested by having the patient touch the tip of his nose with the index fingers, one then the other, first with open eyes, then with them closed. The same characteristic motion as with the feet will be found. This may be extended by having him touch the tip of the ear, or any given point that normally ought to be done correctly. He may place the tips of the index fingers together directly in front, pull them apart, and bring them together again rather rapidly, first with open then with closed eyes. The same general character of motion will be present in all these. Frequently there will be trophic disorders present, either affecting the joints or the skin. Even quite early, but always late, there will be more or less difficulty in urination. The anesthesia of the urethra prevents the patient often from knowing whether the urine is flowing or not except by sight or sound. The sexual instinct and power are very likely to be increased very early but decreased later, and finally lost entirely.

On account of the anesthesia of the rectum there is likely to be continued constipation.

Diagnosis.—In multiple neuritis, the bladder, rectal and eye symptoms will not be present. It is true there may be an optic nerve atrophy, but it is the result of a retino-neuritis, and not a primary atrophy. In the multiple neuritis there will be tenderness over the inflamed nerves.

The neuritis following diphtheria is sufficiently differentiated by the history.

Diabetes mellitus may early be mistaken for this. The urinalysis which must always be made in every case, will be sufficient to enable the distinction to be made.

Prognosis.—The prognosis is unfavorable, recovery rare. This is the universal opinion. Death may occur from a cystitis, marasmus, infection from bedsores, or from some intercurrent disease. The patient, however, is likely to live from ten to thirty years.

The disease is essentially one of progression, but usually, with many partial remissions. There are likely to be times when the disease seems to be arrested. The periods of amelioration and exacerbation are variable as to time. If the case is progressing, each exacerbation is likely to be just a little worse in general characteristics than the previous one. If the case is improving, the opposite will be found, the ameliorations will be of longer duration, more marked, and the exacerbations less pronounced. No opinion as to whether the case is progressing can be formed, except in periods of six months or a year. The comparison of one month with another is of no value.

Treatment.—I believe that a very much larger percentage of these cases could be not only materially relieved, but positively cured, if the physician and patient had sufficient perseverance and patience. It is almost the universal habit for the physician to make the diagnosis, give a positively unfavorable prognosis, make some prescription, and give the case no more thought.

It is equally a universal custom for the patient to try one physician after another, one advertised treatment after another, never being willing to stand by one man a long enough time to enable him to accomplish anything.

I am not finding fault with either the physician or the patient. The reasons for their want of what I consider essential to a fair effort to cure are obvious. I myself have not for years undertaken the treatment of a case of locomotor ataxia, without having a promise from the patient that he will continue under my direct care for a period of from three to five years. Even with this promise and a full understanding of the reasons, many do not hold out more than three to six months.

The first thing the patient demands is, as a rule, a relief for the pain I know of no analgesic, hypnotic or narcotic that has not been tried over and over again. All succeed sometimes, all fail many times. Opium in any form must never be used for the relief of these pains, unless it be in the very latest stage. No one can use this drug for these pains and not form the opium habit. The time must necessarily come when the opium will cause more suffering than it has given relief.

The bromides and chloral hydrate are not efficacious, and they should not be used.

The various analgesics, if they do not contain opium, may be tried. The coal-tar preparations for the relief of pain may be used. *Sodium salycilate fifteen to fifty grains at a dose* repeated once in two hours until relieved. Antikamnia in these cases has worked very well indeed. In many cases it has failed entirely. *Cicuta virosa tincture* in five- to twenty-drop doses and *Cimicifuga tincture* in five- to ten-drop doses, have given relief in some cases. I have also used with good effect hypodermatically duboisia one one-hundredth grain, repeating in an hour if needed, also hyoscyamine hydrobromate one one-hundredth grain. For curative purposes *Ergot* (30.) four doses per day.

Plumbum (30.) four doses per day. *Aurum et sodium chloride* (3x trit.) every two hours. *Mercurius iod.*, and *bin. iod.* (3x to 6x) every two hours. *Aluminum* one-fiftieth-grain doses three times per day are the remedies most likely to be of benefit.

If there is serious vomiting, it can be controlled by *Cerium oxalate* (3x trit.) or by the indicated remedy. I no longer use iodide of potash in these cases.

Suspension, or hanging, I consider an essential element in the treatment of this disease. It, at one time, gained wide popularity, which it has entirely lost, not because it was not useful, but because it was not rightly used. Very few physicians desire to take the time or give the necessary attention to details, to get the best results from this treatment.

The Sayre's Hanging Apparatus.—Great care is necessary in this operation. The arm and head straps should be adjusted so that there is about equal pressure on each. The headstraps must be adjusted so as not to unduly press on the blood vessels in the neck. The angle must be so arranged that the chin is not pressed backward, and at the same time the chin piece must keep up anteriorly on the chin enough to prevent possible slipping back and choking the patient. The patient and apparatus adjusted, the operator should pull very slowly on the rope, and raise the patient so that he can just rest lightly on the balls of his feet, kept in this position a half minute, and then very slowly lowered, till he stands on his feet, and firmly. It is of the greatest importance that this caution of letting the patient down very slowly, should be carried out. Remember, he must regain his balance, and stand firmly on his feet, before all tension is let off.

The pulse and face must be watched for any signs of faintness. If any occur, he must be let down at once. After two or three days, he may be suspended an entire minute. Increase a half minute each two or three days, till three minutes is reached. Then he may be drawn up so that the feet do not touch the floor at all for one minute, increase this as before, to three, or possibly even five minutes. The operation should be repeated daily. This treatment very frequently relieves and sometimes stops the pains, reduces the inco-ordination, and increases the sexual powers.

Other methods of extension may be used. The Sayre's extension table is excellent. I am not at all certain that it is not decidedly better than the hanging. The same principles, methods, and caution apply.

The patient may sit with legs extended, on a flat surface, bend the body so that the head is near, or touches the knees; hold in this position by the hand, or a strap encircling the head and knees, about five minutes. The patient may lie on the back, the operator grasps both feet, and keeping the knees straight, bends the legs on the hips forward as far as possible, that is, brings the legs and body as near together as possible. The extension treatment should be continued about three weeks.

After about three weeks, I commence dry cupping over the spine; put on the cup, exhaust thoroughly, allow it to remain about two min-

utes. Go over the entire length two or three times. Give this also daily, immediately preceding the extension.

Then the *percuta* should be used. This treatment was first brought to special notice by Mortimer Granville, of London. It is systematic nerve vibration. I have not space to give the theory here. If results are to be obtained, the utmost care and attention to details must be given by the operator. The treatment must be given at the same time each day, and for the same length of time on each point, and in exactly the same order. It will require for the full treatment, about forty-five minutes. Instead of Granville's instrument, which is cumbersome, and likely to get out of order, I use a dental hammer, with a flat striking surface, about one eighth of an inch in diameter. I depend on these three methods, and have been very much gratified with the results obtained.

In short, this is the method: Spinal extension three weeks, then spinal cupping and extension three weeks, then nerve vibration alone five or six weeks. From this time on the nerve vibration is continued with occasional interruptions for two or three weeks at long intervals for two or three years. At the end of the five or six weeks in which the nerve vibration alone is used, I again use the spinal extension for five or six weeks, with the vibration immediately following, and then the spinal cupping for five or six weeks. These two I alternate every five or six weeks right along.

I have not in my own experience been able to secure results from the use of heat in any form. The alternate hot and cold douche to the spine has been very highly recommended, so also have various kinds of baths. I am not prepared to advise against them, but I do not use them. Electricity in any form is, I am convinced, useless in these cases.

As to exercise, the patient needs the open air and sunshine, but he must take as little general exercise as possible. He should even in the early stages lie down the greater part of the time. He should, however, undertake the re-education of his co-ordination centers and paths, by regular rhythmical volitional movements, requiring co-ordination: not violent movements, not such as require strength, but such as do require co-ordination. He should begin with simple exercises, and gradually make them more and more complex. This may be done two or three times daily, and to an extent just inside of fatigue. This method is of the greatest importance.

It is hardly necessary to say that any other condition the patient may have must receive attention. The urine may have to be drawn with a catheter; if so, the greatest aseptic precautions, as well as mechanical caution, must be preserved.

Sometimes the intrameatal faradism will be useful for urethral and meatal contractions. The bowels must be kept as nearly natural as possible. Nutrition is very important. It may be necessary to supplement ordinary food with the glycerophosphates regularly. Alcohol must be tabooed. Tobacco, if used at all, must be by smoking, and confined to an after-dinner or night smoke.

LATERAL SCLEROSIS.

Synonym.—Spastic Spinal Paralysis of Adults.

Etiology.—This disease usually appears not earlier than twenty nor later than forty years of age. It may develop after childbirth, or follow acute infectious diseases. It may result from traumatism. It is claimed that lead poisoning or *lathyrus cicera* and *lathyrus sativus* will cause it. It may be the result of syphilis.

Pathology.—The pathology is not definitely settled. It seems to be established that we may have simply a sclerosis in the lateral columns, but in by far the larger number of cases there will also be found lesion of the crossed pyramidal tract, and of other portions of the cord, by the time it reaches autopsy.

There is a form, probably hereditary, occurring from twenty-five to thirty years of age, and attacking only the male members of a family. In this the cerebellar and the Gower's tract are involved in addition to the lateral.

Symptoms.—After a walk that is not considered unusually long, one leg will feel tired and possibly a little stiff, especially below the knee. This will occur after every walk. After a time the same sensation appears in the other leg. This sensation after a time comes after shorter walks, and is very gradually felt higher up the legs. This may last some years with simply slight increase in this sensation. On testing the knee jerk, it will be found exaggerated. Later, other people will notice that there is a stiffness of the legs in walking. The first that the patient notices the stiffness, except the simple sensation, will be in dancing, skating, climbing hills or other exercise requiring quick movements. If passive motion is attempted at this time, the rigidity will be observed. The tactile sensation will be normal; there is no pain; the bladder and rectum are not implicated. The gait is slow, it is difficult to raise the toes from the floor, and the patient takes very short steps. In some cases if the foot is rested on the ball, there will be a decided rather rhythmical tremor. Sometimes all active movements have a tremor, usually of a coarse character. It may take twenty years to develop, or it may develop in a few years, and then

remain stationary. In some cases the arms become affected as well. The symptoms will be the same as those in the leg.

In many cases other central diseases appear during the course. The physician should be on the lookout for these.

Diagnosis.—Many of the hereditary and family spastic paraplegias are accompanied by cerebral symptoms, which will make differentiation clear. It must be differentiated from a myelitis or a pressure spastic paraplegia. This may not be easy in the early stages, but the development will clear it up. The entire absence of sensory symptoms, and of bladder and rectal involvement, combined with the increased deep and superficial reflexes, will usually be sufficient to warrant a diagnosis of lateral sclerosis.

In multiple sclerosis, the ophthalmoscopic examination will show changes in the eye. These are not present in this form of paraplegia. There will also be some cerebral symptoms.

In hysteria there will be the usual collateral evidence of the hysteria, and the one great diagnostic point in hysteria, that the patient does not have some one or more of the essential symptoms, and usually has some symptoms impossible to the disease simulated.

From hysterical neurasthenia, taking this type, a diagnosis early is impossible, but will offer no obstacles as the case progresses.

Prognosis.—It is essentially a chronic disease, and progresses very slowly. It may run twenty to thirty-five years, or even longer. A few cases that seem to be well authenticated have recovered, others have developed to a point of simple inconvenience, and remained stationary.

Treatment.—Spinal cupping; the galvano-puncture, mild faradism to the legs; nerve vibration. Heat treatment, the kind of baths in which the temperature of the patient is raised from $\frac{1}{2}^{\circ}$ to 1° seems to be of service in some cases. Rhythmical volitional movements, in various ways, of the legs, in the earlier stages, may be of use.

Plumbum (30.) is a remedy that ought to be of some service, and, if continued for a long time, may be. *Lathyrus sativus* (30.) ought to be indicated. It certainly should be tried. A very large number of these cases are complicated with other organic diseases of the brain and cord; and the treatment must be governed to a considerable extent by them.

Combined Disease of the Posterior and Lateral Tracts of the Spinal Cord.

Pathology.—These are of a sclerotic character. We may have proliferation of connective tissue and destruction of cells in the columns of Goll and Burdach, the direct cerebellar and the crossed pyramidal

columns. As a rule, however, we do not have the diseased condition following any system, but very irregular. It will be noted that we have in this disease two conditions diametrically opposed to each other. That of the posterior tracts, causing inco-ordination, pain, muscular weakness and loss of the knee jerk, while that of the lateral tracts causes increased muscular tone, paralysis, no pain and an increased knee jerk.

The symptoms of one or the other will predominate, depending on which antecedes, and in which the progression is most rapid. No definite line of symptoms can be given. But a careful consideration of the symptoms of *tabes dorsalis* and lateral sclerosis will enable a diagnosis to be made. There will rarely be present all the symptoms of either.

The ophthalmoscopic examination, showing partial atrophy of the optic nerve, and the disturbance of speech characteristic, will indicate multiple sclerosis.

Prognosis. — This disease may terminate in a few months or one or two years. The termination is usually fatal. A few cures are reported.

Treatment. — That suggested for *tabes dorsalis*.

HEREDITARY ATAXIA.

Synonym — Friedreich's Disease.

Etiology. — Indirectly hereditary. The parents or blood relations have suffered from epilepsy, or some disease of the brain, or the parents have dissipated. It usually attacks several members of a family; rarely only one is affected.

Pathology. — There is general atrophy of the spinal cord. It is much reduced in size. Goll's tracts are usually entirely absent, Burdach's nearly absent. Degenerated ganglion cells, and atrophy of the fibers in Clarke's columns.

Symptoms. — The first symptom will be noticed during or preceding puberty, but rarely under seven years of age. The very early symptoms, probably on account of the youth of the patients, and consequent inattention to feelings, and inability to describe them, are very uncertain. The first thing that is observed, usually, is that the patient spreads the legs apart and stamps in walking. The gait is staggering; the unsteadiness or swaying is not increased by closing the eyes. There is, however, a marked inco-ordination either when standing or lying down. Muscular weakness does not appear till very late in the case. When standing or walking there is frequently a nodding or swaying

motion of the head. Tremor and choreic symptoms are quite common in involuntary muscles. The disease tends to progress upward, and the upper extremities present the same line of symptoms as in the lower.

Tendon reflexes are abolished early, but there are practically no sensory disturbances until very late. The bladder is not affected; the speech is almost diagnostic — it is slow and indistinct, one word or syllable will be drawn out long, another cut very short, in the most irregular way. Nystagmus will be present. The mind is not affected. Club foot often occurs.

Prognosis. — The condition will last through life. The patient dies from some intercurrent disease. All authorities agree that no case has ever been materially helped or cured.

Treatment. — There is none, except to take the best care possible of the patient, and protect him from injury.

MULTIPLE SCLEROSIS.

Synonyms. — Disseminated Sclerosis, Cerebro-spinal Multiple Sclerosis.

Etiology. — Most frequent in men. While there are a very few incomplete cases recorded in children and in young people, it rarely comes on before thirty, and practically never later than forty-five. The patient will have the neuropathic temperament.

The most frequent cause is infection. It may follow typhoid fever, malaria, erysipelas, diphtheria, cholera or rheumatism. It is probable that it sometimes results from traumatism, and possibly sunstroke. Syphilis, I believe, is never a cause.

Pathology. — Sclerosed spots from one twenty-fifth to an inch in size, grayish white, harder than normal brain tissue, and softer than connective tissue, will be found distributed irregularly through the brain and spinal cord. There are more of them in the white than in the gray matter. The process commences in the white matter. These spots are composed of fibrous tissue, and are not usually connected with the walls of the blood vessels.

Symptoms. — In a very large proportion of these cases, the first symptom is a peculiarly sharp, sudden pain in the frontal region. It is of short duration, and very irregular as to frequency. This symptom may be present a considerable time previous to any other signs, and is rarely, if ever, considered as indicative of an approaching serious lesion.

When this symptom is noticed within a year or two following any cause for infection, or a severe injury, and no other cause for the peculiar pain can be ascertained, the physician must always be suspi-

cious of this disease. The next symptoms to be observed are usually weakness and stiffness of the legs, with some loss of sensation, or a feeling of numbness. There will begin to be a fine tremor of the hands on every attempt at voluntary motion — *the true intension tremor*. He will begin to have difficulty in walking, possibly some ataxia in the arms and legs both. The speech now becomes scanning, that is, a tendency to slowness and to pronounce each syllable by itself. There may be some difficulty in swallowing. The gait becomes awkward, sometimes staggering, as from being drunk. The tremor in the hands becomes jerky, so as to interfere with their use in writing, passing food to the mouth, or in doing anything. Nystagmus appears, it may be only when the eyes are turned from the object. When the tongue is protruded it is in a jerky way. There is very little sensory disturbance. The sense of weight and pressure is intact or nearly so, the reaction of the pupils is normal except in very advanced cases. The tremor spreads so as to involve the muscles holding the head, causing a constant shaking when sitting up. It may spread to other muscles as well.

The ophthalmoscope will show an atrophy of the temporal side of the disk. This is quite characteristic of this disease. Later there may be atrophy of the entire disk.

There may be occasional attacks of vertigo or of unconsciousness, but they will be transitory. The mental conditions are in the main good. There may be some slowness of the mind, and possibly some melancholia. There is quite likely to be some deafness, and some alterations of taste. The predominant symptom is the tremor.

The tendon reflexes are exaggerated, as are also the superficial.

The electrical reaction is not altered.

In a few cases there will be marked atrophy of certain muscles, or of an entire extremity, but without electrical changes.

If the tremor perceptibly and regularly increases when the eyes are closed, there is certainly an element of ataxia present. If this is more pronounced, there will be a dragging of the toes, they will seem to be glued to the floor, and it is difficult to raise them to take a step.

This disease is essentially chronic, lasting from five to twenty years, or even longer. It is very irregular in its course. There may be long periods in which there seems to be no progress, or even decided improvement. Again there may be more or less frequent attacks of an almost apoplectic nature, each attack marking a distinct aggravation of the disease. Then again there may be an arrest of progress and gradual steady improvement to a point of practical cure. Again it may run a steady, even course of progression to the end.

Diagnosis.—In paralysis agitans, the disease most resembling it, the tremor is better on voluntary effort, and worse when at rest, except when lying down or sleeping. It is not always as easy to differentiate as would at first appear, but a few days or weeks of careful observation will render the diagnosis certain.

In *paralytic dementia* the mental symptoms are much more pronounced, and the tremor is not of the intention type, and is much more irregular.

Prognosis.—As to life is good. Death may occur in a few cases from an apoplectic attack, or because of the bulb becoming affected. A few cases have died from bronchitis, resulting from interference with the respiratory centers. The disease as indicated above, occasionally has a distinct, long-continued remission, sufficient to consider it a cure.

Treatment.—The patient should be kept reasonably quiet, not in bed, but must avoid exercising to the point of fatigue. The mind should be, as far as possible, pleasantly occupied, undue exposure of any kind must be avoided.

I believe that in the early stages much can be accomplished through eliminating baths. I mean hot water baths in which the temperature of the patient is elevated from 1° to 2° . The patient should be taken out, placed on a cot warmly wrapped, and allowed to perspire from twenty to thirty minutes. This should be followed by brisk surface rubbing and spitting. A bath of this kind may be given every day until the patient develops many typhoid symptoms, including a slight fever. In giving these baths a cold wet cloth should be placed around the neck, and the head constantly sponged with cold water. Pay no attention to the temperature of the water further than to see that it does not cause a chill or scald the patient. It is the temperature of the patient that is to be considered.

This treatment cannot be given in advanced cases, because of the danger of hemorrhage in some one or more of the sclerosed spots.

The galvanic current has been of decided value in my experience. I always use central galvanism on alternate days, each treatment lasting about twenty minutes. I frequently use the current in other ways depending on special indications. The faradic current, I believe, cannot be of any service.

Nerve vibration as recommended by Mortimer Granville, a description of which will be found in Hale's "Practice."

Massage at least three times per week should be used, not simply for the comfort it gives the patient, but for actual benefit.

Internal medication has not as yet developed anything curative.

Aurum et Sodium Chloride (3x trit.). *Mercurius biniod* (4x), *Kali iod.* (6x trit.), *Kali phos.* (3x trit.), *Magnesium phos.* (6x trit.), may any of them given as indicated be of service.

Merck's hydrobromate of hyoscyamine (4x trit.) a three-grain powder every three or four hours, may be of great help in controlling the tremor. This is to-day the very best remedy to control this aggravating and wearing symptom; it may however have to be used in larger doses. If the 4x does not give the desired result, I employ one five-hundredth grain tablet once in four to six hours. I have found it necessary in a few cases to give the one one-hundredth grain hypodermatically two or three times per day.

For sleep, trional fifteen- to twenty-grain doses at night often acts nicely.

Passiflora tincture from one to two teaspoonfuls in one-half glass of water, and taken in three doses half an hour apart about bedtime, may act well. It may be found necessary to use chloral hydrate, the bromides or a combination of the two. I prefer of the bromides,—the sodium, the ammonium or the gold.

POLIOMYELITIS ANTERIOR ACUTA.

Synonyms. — Infantile Paralysis, Acute Atrophic Spinal Paralysis, Spinal Palsy of Children.

Babies have this disease. It frequently comes on when the baby is about five months old, less frequently after seven months until about the second to the fourth year, after which it becomes less frequent through life, although no age is absolutely exempt.

Etiology. — In a very large number of cases it is impossible to assign any cause. There are certainly a great many cases of traumatic origin; and many others from exposure of various kinds. It is of infectious origin in many cases. It is claimed that there is a tendency for it to appear in a semi-epidemic manner. It quite frequently follows the acute infectious diseases of children.

Pathology. — Acute inflammation of the gray matter in the anterior horns of the spinal cord. If we examine a recent case, we will find dilation of the blood vessels (active hyperemia) with hypertrophy. There are often thrombi or slight hemorrhages to be found. The cell nuclei are indistinct, the prolongations are atrophied. The ganglion cells are clouded.

If the case has been of long standing, there will be atrophy of the cells and fibers. The anterior horn is likely to be shrunken and small.

Symptoms. — In my own experience, in by far the largest number of cases, the first and only symptom has been a sudden paralysis of the monoplegic type, one arm or only one group of muscles in the arm, or one leg, or one group of muscles in the leg. It is a complete flaccid paralysis, and is followed by atrophy of the paralyzed muscles. During the first week there is as a rule some lessening of the area of paralysis. After this the tendency is to remain stationary except for the muscular atrophy, which continues for a short time and then remains stationary also.

In many cases there is a chill, a rise in the temperature, possibly nausea and vomiting, there may be a slight convulsion. Stupor, and even mild coma may be present; this febrile disturbance may last only a few hours, or it may not abate for several days. At or near the termination of this febrile attack the paralysis is observed. The paralysis stated above is usually a monoplegia, but it may affect both legs or both arms, a leg and an arm on the same side, or a leg on one side, and an arm on the opposite, or the four limbs. As stated above there is always retrogression of the paralysis during the first week or ten days, there may then be only one muscle or group of muscles affected.

There is no pain, sensation is normal, the superficial reflexes of the paralyzed muscles are absent. The deep reflexes are of course also absent although the test for these in young children can never be at all satisfactory. The member in which the paralysis remains will not grow as rapidly as its companion. The greater number of muscles affected in a member, the less likely to be the growth of that member. There will be a deformity as a result of certain muscles being paralyzed and their antagonists being normal. Thus a hand may be misshapen in various ways, or there may be almost any form of talipes, or there may be spinal curvature. The joints may be loose.

Prognosis. — This is a disease in which the prognosis could be much better than it is, if the physician and the child's guardian had more patience and perseverance. I am fully conscious of the fact that a great many cases occur in poor families, where it is impossible to obtain the long-continued, persistent, regular treatment, essential to a cure. The parents or guardian if ever so willing, cannot possibly give the time and attention, on account of other cares and responsibilities. Very few dispensaries have the equipment, either of apparatus or attendants, that will enable them to furnish the treatment necessary. There are few hospitals that can afford to take these cases, and give them the necessary treatment over as long a period as required, and the internes and attendants, if the patients were admitted, would,

as a rule, become discouraged and careless. There are, however, a sufficient number of cases occurring in families who have the means to raise the prognosis of this disease much higher if the patience and perseverance were present. I will not undertake a case of this kind without a promise of at least five years' effort.

There is no thought of death. It is simply a deformity with some one or more muscles absolutely useless. Any muscle that shows faradic reaction at the end of the second week may be restored, and any muscle that will show galvanic reaction at any time, I believe it possible to restore.

Treatment. — For the febrile stage, the ordinary indicated treatment for the symptoms present. The diagnosis is not yet known. *Aconite* and *Gelsemium* are likely to be most frequently indicated. As soon as the paralysis is observed, *Squibb's Fl. Ex. Ergot* in from three- to ten-drop doses every three hours should be given. This should be followed by *Gelsemium* (3x dil.), every two hours for a couple of days. Then *Belladonna* (30.) for two days, when *Aconite* (30.) every two hours, should be given for the next two months. After this *Plumbum acct.* (30.), *Iodine* 30., *Kali iod.* (3x), *Magnesium sulph.* (6x) are most likely to be of service.

Electricity is a sheet anchor in these cases. The use of it should not be commenced until two weeks after the attack. Then a downward galvanic current of from two to three milliampères, or three to five cells of an ordinary portable battery given twice per day or perhaps three times a day. After this has continued for one week, the faradic may be reduced to once a day. The faradic current is to be applied, one large flat electrode over the seat of the lesion in the spine, and the smaller electrode over the motor points for the paralyzed muscles, just strong enough to produce slight contraction of the muscle, if possible without causing too much pain, or as strong as the child can stand. Each treatment should last about five minutes for each paralyzed member, and be applied once each day. After this line has continued about a month, the reaction to electricity should be tested, first with the galvanic current. The direction of the current with one pole over the affected segment of the cord, the other on the motor points for the affected muscles, the direction of the current that will give a contraction, with the lighter current should be noted. Having determined this, all applications after this are to be given with the current running in that direction. The treatments should be given every day, twice a week the downward spinal galvanic current supplemented with the galvanic treatment to the affected muscles, the other days the spinal muscular faradism. Keep this up all through the treatment, and do

not let the family get a machine and undertake the treatment themselves, nor allow any but a thoroughly competent and careful attendant to administer it.

Heat is another valuable adjunct in these cases; it may be commenced after the first month. Have the member in which there is paralysis immersed daily in a hot water bath; the temperature must be regulated somewhat by the age of the patient.

It must be as hot as can be borne without injury to the skin. In older children the water should ordinarily be about 100° F. when immersion takes place, and gradually raised to 104° F. Great caution should be observed in pouring in hot water to raise the temperature, to avoid scalding the patient. When taken out of the water, rub the member with a coarse towel till quite red. There should also at another time of day, and every day, be given a salt rub; the operator takes a hand full of ordinary table salt, wets it thoroughly, and rubs the member briskly for some minutes.

Massage is always indicated after the first month.

After six or eight months, oil rubs may be of use. Contractions must be guarded against by persistent regular extension of any tendons or muscles from the first indications of contracture.

Any possible sources of irritation must be removed at once.

There is a class of functional or reflex cases of this kind that should be mentioned; at the onset there is no way to distinguish them, as a rule. It is this kind of a case in which the quick cures are reported.

The favorite time for appearance is during dentition. The paralysis is seemingly identical with the genuine, but is not followed by muscular atrophy, at least not more than can be accounted for by non-use.

A long foreskin, or one with a very small opening or an adherent prepuce may be present, and circumcision cure the case at once. In little girls it may be the clitoris, or irritation of these parts; cure this, and the paralysis shortly disappears.

There may be other irritating affections, the clearing up of which promptly relieves the paralysis.

In every case every part of the body should be carefully examined. In two cases I am sure that pin worms were the source of the trouble.

In all these cases remove the irritation, use massage and faradic electricity. If unable to determine whether functional or organic remove the irritation and treat as an organic. *Calcarca carb.* (30. trit.) and *Belladonna* (30.) are the remedies.

ACUTE ANTERIOR POLIOMYELITIS OF ADULTS.

Synonym. — Acute Atrophic Paralysis of Adults.

Etiology. — The onset is usually between 25 and 30 years of age. The disease is not at all common. It may follow an acute infectious disease. Gonorrhoea may be a possible cause. Traumatism, exposure to severe cold, and overexertion, are the chief factors.

Pathology. — The same as in children.

Symptoms. — The onset is probably always preceded by a febrile disturbance lasting one or two weeks. There may be some pain in the spine, and occasionally radiating from it. If the radiating pains are present, and there is tenderness along the course of these nerves, there is a neuritis as well.

The paralysis includes as a rule, a much larger permanent, as well as transitory, area. Within a month, however, many of the affected muscles regain full function and others incomplete function. In some cases this partial recovery is not commenced for two or three months. Atrophy of the affected muscles begins within a week or two, and the reaction of degeneration can usually be made out in two or three weeks. The electrical reaction will be present again in a year or two.

Prognosis. — These cases probably do not recover. There is no fear of a fatal termination, nothing but a permanent paralysis.

Treatment. — I can advise nothing better than that for children, with such modifications as will naturally be thought of from the difference in age.

SUBACUTE AND CHRONIC ANTERIOR POLIOMYELITIS.

Synonyms. — Subacute and Chronic Atrophic Spinal Paralysis.

These forms of paralysis never occur until sometime after fifty, more frequently after sixty-five years of age. There is no antecedent febrile disturbance. One foot will become weak, then the lower part of the leg, this weakness will gradually be felt higher. The opposite foot and leg will then be affected in the same way. There may then be steady progression upwards, the trunk muscles being next weakened, or these may remain intact, and the hands and arms become involved. The progression is moderately rapid, both as to the increase in the areas affected and the degree of weakness of the muscles. It will be found on examination that not all the muscles of any member are affected. Some will remain normal. The reaction of degeneration may be observed in a few weeks. Atrophy of the affected muscles always follows the paralysis. The paralysis is of the flaccid type, and of course

there is no tendon reflex present. There are no sensory symptoms. Fibrillary twitching will be present in the affected muscles.

Prognosis. — In a fair proportion of these cases the progress limits itself at some point, the earlier this occurs, the better the chance not only for life, but for cure. In some the progress is steady until the entire body is affected and death results.

Treatment. — The galvanic and faradic treatment suggested for the acute infantile form, after having made the test by which the direction of the current is determined, should be employed. Heat treatment should not be used. A minimum of exercise should be advised. I know of nothing else to advise.

AMYOTROPHIC LATERAL SCLEROSIS.

Synonym. — Spastic Paraplegia with Atrophy.

Etiology. — Very rarely it has been observed in children. It is essentially a disease of middle life. Exposure, traumatism and over-exertion seem to be the chief causes. But a number of cases have developed succeeding intense emotional disturbance, in which it seems that this may have been the direct cause. We must I think consider a predisposition to nerve trouble as being a prime factor.

Pathology. — Atrophy of the pyramidal tracts, anterior horns and anterior nerve roots. The sensory columns are not affected. Cell bodies with their fibers degenerate. This same condition extends through the analogous parts of the medulla and pons. It may be traced to the cerebral peduncle, and has been found even in the internal capsule.

Symptoms. — Charcot divides this disease into three stages. It will be noticed that we have a combination of bulbar paralysis, spastic, spinal paralysis and chronic anterior poliomyelitis.

First Stage. — There will be a fine tremor of the upper extremities, one may be affected a little before the other, or both at the same time; following this, will come together fibrillary twitching, and an increasing paralysis of the arms and hands. Following the loss of motion rapidly, there will be marked atrophy of the muscles and rigidity sufficiently marked to cause deformity from muscular contracture.

The characteristic deformity is the hand, flexed at or near a right angle on the wrist, the fist clinched with thumb drawn in over the fingers. It is very difficult to pull the hand open or to extend the wrist. There may be some rigidity or spasm of the muscles of the neck and jaw. When the atrophy of the hand and arm becomes very pronounced the rigidity and spasm of the jaw and neck usually subsides.

This stage will take from four months to a year to develop. There is then commonly a period of several months in which there is no progress, but the disease seems to remain stationary.

Second Stage. — We now have the lower extremities affected. There will be a gradually increasing paralysis of both legs, and at the same time clonic or tonic spasms of the forearms. The paralysis does not affect all the muscles of the member. Very soon spastic symptoms will appear, and there will be an increasing muscular rigidity, until here also, we may have deformity from muscular contracture. The knee jerk will be exaggerated. A little later there will appear atrophy of the affected muscles in the legs, the rigidity, as a result, becoming less and less pronounced, and the knee jerk finally may be entirely abolished. The muscular atrophy in the arms increases rapidly during this stage.

Third Stage. — There now appears a progressing paralysis of the muscles of the tongue, pharynx and larynx, with consequent impediment in articulation and swallowing. There will be a constant drooling. The respiration becomes more and more markedly affected, and the circulation irregular.

Diagnosis. — The symptoms and progress are so typical, as a rule, that a mistake is not easy. The distinguishing feature to be remembered is the combination of atrophy following paralysis, attacking groups of muscles, and not whole members, nor individual fibers, with contractures and a rapid development.

Prognosis. — Death in two years always. It usually results from interference with respiration, or may be caused by choking on account of food lodging in the throat.

Treatment. — There is none to offer. The very best hygienic surroundings and nursing is all that can be suggested.

DISLOCATIONS AND FRACTURES OF THE SPINAL COLUMN.

The most frequent seat of dislocation of the vertebræ is between the first and second and fifth and sixth cervical. They do not often occur in either the dorsal or lumbar region.

If the luxation is only of one side, the head will be bent toward the opposite shoulder, and partly rotated so as to have the chin point somewhat toward the affected side. If dislocation of both sides, the head will be bent forward, the entire column will be held very rigid by the contraction of its muscles; the slightest movement will be painful. On palpation, a prominent spinous process will be found, this is of the vertebræ below the dislocation. If of the upper cervical region, a prominence may be felt in the pharynx.

Fractures may occur in any part of the column, but are most frequent in the third or fourth cervical, the first and second dorsal and the first lumbar. The deformity is much the same in both conditions. The dislocation produces a fixed position of the trunk above, and with the fracture there will often be also crepitation, and possibly movable pieces. However, the outward signs are not always well marked. There can be no doubt that at times there is a dislocation, producing injury to the cord, but spontaneously reduced by the injury causing it. In these cases there will of course be no deformity. It is possible that either fracture or dislocation may result from great muscular exertion, but nearly always there will be sufficient evidence of traumatism.

Meningeal central hemorrhage may be caused.

Symptoms.—Of the first and second vertebræ almost invariably instant death. If not, the peculiar position of the head, local pain, with radiating pains along the upper cervical nerves. The occipital pain and stiffness of the neck are marked. There will be difficulty in breathing, and possibly paralysis of the upper cervical nerves. There may be a myelitis as a result. There is danger of sudden death from some inadvertent movement. If of the third or fourth vertebra the principal element of danger is from affecting the phrenic nerve.

A few general points may be mentioned sufficient to enable a probable diagnosis to be made; for a full consideration, books on surgery must be referred to. As a rule the cord will be injured to such an extent as to destroy all conduction to or from the brain, and as a result, motor and sensory paralysis of all the body below the lesion. If there is only a part of the cross section affected, which does at times happen, there will be a difference between the level of the paralysis and the injury. It is possible to have the motor paths compressed or injured, and the sensory nearly intact. If the entire cross section is affected, the bladder and rectum will be affected. If only partially, they may not be. Complete cross-section injury will destroy all the reflexes below, while partial may not only not destroy, but may cause exaggerated reflexes. A very common symptom of injury to the cord is erections of the penis, often an emission at the moment of injury. This symptom is most marked in injury to the cervical region.

Prognosis.—This is always serious. Death may be immediate, or follow at any time from a slight movement, from a meningitis, a myelitis, or other causes. If the patient lives, entire repair of the injury is hardly to be expected. Frequently there will be a considerable improvement within the first two months. Very little can be expected. Surgery has materially modified the gravity of the prognosis within the last few years.

Treatment. — The greatest care and caution must be observed in moving the patient. The examination, too, must be made with care. There should be no bending or rotating of the trunk that can possibly be avoided. In fact, in getting the patient home or to a hospital, or in changing bed linen, examination, or in doing anything, not one unnecessary motion of the patient must be made. The spine should be well supported, especially in the region of the injury. If possible, he should be placed on a water or air mattress. If not attainable, water or air pillows for the buttock should be made, in order to prevent bed sores.

Attempts to reduce dislocations by manipulation should be avoided by any but an expert surgeon. Even he should not attempt to reduce a fracture.

As to the advisability of operative interference, I can only recommend what I practice. Get the opinion of a thoroughly competent, skillful surgeon. If this is not attainable, keep the patient in the best possible condition, as free from motion as possible for from six weeks to two months. Draw the urine with a catheter if needed. Move the bowels with enemas, see that the parts and the bedding are kept clean and dry, and give the patient *Arnica* (3x) internally.

CARIES OF THE VERTEBRAL COLUMN.

Symptoms. — Tubercular Spondylitis.

Etiology. — If the fungoid purulent matter enters the spinal canal, or, if from dislocation the cord is compressed, and there is a sudden curvature causing compression we will have spinal neural disease. It may be an external pachymeningitis, rarely a combined pachy and leptomeningitis and still more rarely combined with a myelitis. There may be anemia of the cord as a result of obliteration or closing of arteries supplying the cord followed by passive hyperemia and softening. The tubercular infection may cause a softening, through an arteritis obliterans. The dorsal region is the most frequent seat of that trouble, although it may occur in other regions.

Symptoms. — Pain is likely to be a prominent symptom, it will be at the seat of the diseased vertebræ. There will be sensitiveness to pain on pressure on the spinous process of the diseased vertebræ. If there is a well-defined, localized sensitiveness and pain on deep pressure, there is a suspicion of this trouble. Hot water applied over the spot will cause pain as well as the positive pole of a galvanic battery. The deformity or presence of a gravity abscess will of course determine positively. There is likely to be a girdle sensation, with disturbance of sensation and a herpes zoster.

The most common symptom is a paraplegia of the spastic variety. Anesthesia confined to the area supplied by the affected segment, hyperesthesia just above it. A girdle sensation. The cutaneous reflex is normal or increased in the legs and involvement of the rectum and bladder.

The symptom will, of course, vary according to the location of the lesion, and also as to whether pressure or disease affects the entire or only a part of the cross section.

Diagnosis.— If there is no deformity, the sensitiveness, the tendency to carry the upper part of the body very rigid and straight or in some cases other indications of tuberculosis combined with evidence of slowly increasing cord pressure will suffice to make a diagnosis.

Tumors and other vertebral diseases may so closely resemble this as to render a diagnosis impossible. That is, a diagnosis of spinal pressure only can be made. In these cases the collateral symptoms and conditions and the progress of the case will be the only means of differentiation.

There are a few hysterical and neurasthenic cases that closely resemble this, but careful examination ought to dispel all doubt. The one great element, the irregularity, and incompleteness of the picture, and the presence of impossible accompaniments, will settle the diagnosis.

Prognosis.— Good if discovered during the stage of simple pressure, that is, previous to any nerve-tissue destruction; more favorable in the young than when older. The more advanced, the less favorable.

Treatment.— This should be directed to the tubercular element in the main. Everything should be done to remove the local trouble and the general tubercular symptoms, including operative interference. It is not the province of this article to go into the treatment of tuberculosis, or the diseases of the vertebræ. There is no special treatment for the spinal disease or condition separate from that.

CARCINOMA AND OTHER TUMORS OF THE SPINAL COLUMN.

This produces very severe local and radiating pains, increased by movement.

There may be simply very severe neuralgia along the course of certain spinal nerves, more commonly bilateral. There may be a rather sudden paraplegia. The collateral evidences of malignant disease will suffice to show its character. There is nothing for the neurologist to say in regard to the treatment,

III. DISEASES OF THE PERIPHERAL NERVES.

NEURITIS.

Definition.—An inflammation of the nerves.

Etiology.—There exists in many persons a seeming predisposition in the nerve trunks to take on inflammatory action. Traumatism of various kinds even pressure, irritation from other organs, and nerve tumors. Such diseases as gout, articular rheumatism, pneumonia, pleurisy, meningitis and joint troubles often produce it. The acute infectious diseases seem to predispose to it. Gonorrhea and syphilis may cause it.

Pathology.—The books recognize several varieties of neuritis according to the part of the nerve principally affected. *Perineuritis* limits itself to the sheath of the nerve. *Interstitial* neuritis is when the inflammation mainly affects the interstitial tissue of the nerve, and *parenchymatous* when the nerve fibers are the seat of the trouble. There is very little clinical difference, however.

In acute perineuritis, there will be redness and swelling of the sheath, the arteries will be overfilled and enlarged, there may be small hemorrhages, following this congestive stage, serous exudation into the sheath and the appearance of white cells, will be found. There may follow this, proliferation of connective tissue, producing small nodules. In the *interstitial* we have swelling, and other changes, similar and usually extension to some extent into the fibers. In the *parenchymatous*, there is the same character of changes, but with a marked tendency to degeneration.

Symptoms.—It will readily be understood that the symptoms must vary widely, depending on the functions and location of the inflamed nerve. I will not undertake a description here, of the special nerves, except to call attention to the fact that if of the cerebral nerves, there will be interference with the special functions, and that we are as yet in ignorance as to the sympathetic nerves as far as any indications of inflammation is concerned.

There is present the general symptoms of inflammation of the mixed nerves. There is first pain in the affected nerve, greater or less according to the degree of inflammation present. It is likely to be a very severe grinding pain, with remissions and exacerbations. Quite frequently, markedly worse at night, so much so as to interfere with sleep. Very soon the tactile sensation will be found less acute, and motion will be somewhat interfered with. The tactile sense may be

blunted or lost. The conduction of pain is likely to be slow. There may be any degree of motor paralysis from slight weakness to absolute uselessness. Atrophy of muscles supplied by the affected nerve is likely to follow. Trophic changes take place, causing a peculiar smoothness and glossiness of the skin. If this glossy skin is on the hand and fingers, there will be a tapering of the fingers from atrophy of the palmar cushions. Fibrillary twitching of the affected muscles are quite common. There may be perspiratory changes. After the disease is well advanced, the reaction of degeneration will be present. It may appear as acute, subacute or chronic.

The physician must bear constantly in mind that any or all of the symptoms may be of any degree, from the slightest deviation from normal to the most absolute uselessness, and the severest pain. Whenever there is pain limited to a single nerve, and its distributions, with tenderness on pressure, look carefully for concomitant symptoms of neuritis.

Prognosis. — Usually favorable. Neuritis frequently seems to be self-limiting, except in the parenchymatous, in these the tendency being to destruction, and not to a cure. While most cases will recover fairly rapidly, many run a long course, and some leave atrophy and stiffness behind that can never be cured.

Treatment. — One thing must be positively insisted on in every case, and it cannot be emphasized too strongly — *rest*, absolute rest. The member which is inflamed should be strapped with adhesive straps firmly and smoothly, and then bandaged. Care must be taken to see that this is done smoothly and evenly, not too tight, and yet firmly enough to prevent motion. If an arm, it must be carried in a sling all the time, and must never be taken out of the sling. The patient must not attempt to use the finger at all. If in a leg and severe, the patient must be put to bed and kept there. If only a mild case, it may be that strapping and bandaging, with a minimum amount of walking or use, will suffice.

Early in the case if the inflammation is severe, a strip of Spanish fly blister over the course of the affected nerve nearly its entire length will be advisable; draw a good blister, dress it properly, and secure rest.

In a case that starts out very acutely, in which I am satisfied that there is marked congestion, I invariably give from one to five hypodermic injections of Squibb's aqueous extract of Ergot from ten to twenty drops at a dose, repeating in from four to ten hours. Never use it in the mild cases or in the chronic stage. As I have intimated in severe cases the pain early is very severe. There is but one remedy for this. I fully realize

the criticism I subject myself to in saying this, and I am entirely willing to accept all that comes. Opium is the remedy for the pain. I nearly always use the deodorized tincture in from fifteen- to forty-drop doses. My usual method is to commence with a ten-drop dose when the great exacerbation of pain is present, repeat every fifteen minutes until the patient is quiet. In this way I never give more than just enough to accomplish the object. It is never given with regularity as to time or frequency and never given when the pain is bearable. I have never had any difficulty in stopping the drug when there was no longer occasion for it. I have never yet had a patient form the habit. Very rarely it disagrees with the stomach, and it becomes necessary to use morphine hypodermatically; when it does, I use the smallest dose that will relieve, but never except the pain is very severe, and never allow it to be used with any regularity as to frequency or as to time. Don't lose time trying any other hypnotic, narcotic or analgesic.

Galvanism is an important remedy. Use large electrodes, never small ones. Place the positive electrode at the peripheral end, and the negative at the central end, of the affected nerve. It may be necessary to bend the electrodes so as to make them fit closely all around. I then slowly turn on the current, till I have from two to three milliamperes, allow to remain stationary from two to three minutes, and then gradually decrease until there is none. A dose of this kind may be given three times per day or it may not be needed more than once per day. I believe it to be always indicated in the acute, subacute or chronic cases, and all through the disease. The faradic current must never be used in acute cases, nor until after atrophy and paralysis is established, when it may sometimes be of use; that is, after the inflammation has subsided. This form of electricity is often very valuable in helping to remove the effects of the inflammation. No matter in what part of the body the neuritis may be, the same principle must be followed in the use of the current.

Very close attention should always be given to the general health all the time.

Every possible source of irritation must be carefully looked for and removed at once if found. You cannot cure or materially relieve a neuritis while the cause exists.

In the cases in which numbness is a prominent symptom, with tendency to paralysis, restlessness and anxiety, *Aconite* will be the remedy. I use it according to the special conditions anywhere from the 1x dil. to the 30. potency. *Belladonna* (2x dil.) in those cases where there is evident severe congestion as indicated by great pain and throbbing. If with the pain there is a tendency to chilliness,

general or local, *Gelsemium* tincture in two- to three-drop doses every hour or two. Or if I find marked aggravations from excitement, I use this remedy in the 30. In chronic cases resulting from trauma I have had some very good results from *Hypericum* (12.); this remedy has not been useful in my hands early in any case. *Arnica* (30.) has been invaluable in many of the traumatic cases from the start, and I have not infrequently found it of great service in non-traumatic cases, where its indications were present. *Ferrum phos.* (6x trit.), if there is an element of anemia. If of rheumatic origin, *Rhus tox.* (1x dil.), *Kalmia lat.*, *Cimicifuga*, *Bryonia* and analogous remedies. It is impossible to detail the useful remedies for the condition. I say, knowing whereof I speak, that there are few diseases in which the physician will feel as well repaid for careful application of remedies as in this, providing he has carefully removed all possible sources of irritation. In many cases strychnia sulph. one sixtieth grain three times a day, will show wonderful results.

MULTIPLE NEURITIS.

Definition.—An inflammation of several nerve trunks at the same time. There is no rule as to the combinations that may be found. There may be only two or three, or nearly every nerve trunk in the body may be affected.

Etiology.—A very large number of these cases are the direct result of poison—arsenic, lead, alcohol, carbon bisulph., copper, mercury and aniline.

Infection is another factor in the direct causation.

Syphilis and gonorrhea must be included. Exposure to damp and cold are occasional causes. May be epidemic. Most common between twenty-five and fifty years of age.

Symptoms.—I find nearly all authorities follow the course of taking the alcoholic multiple neuritis as a type. I will follow in the same steps.

It is always the result of long-continued use. There will for a long time be various paresthesias, such as numbness, tingling, twitching, tremor, sudden giving out for an instant only, and like symptoms of a general nature. Suddenly when about ordinary duties or during or immediately following an attack of delirium tremens, there will be a paralysis. Or there may be severe but rarely sharp pains in the feet, legs, hands or arms, with a feeling of numbness of the soles of the feet and toes and fingers, followed by gradually increasing weakness of arms and legs. The patient may be delirious or have a perfectly clear mind. There will be a gastritis and tremor. There will be a dropping of

the feet, with an inability to flex them on the leg. There may be edema early, or fatty deposits later; if not, the legs will appear thin. Muscles will be soft and flabby. There will be sensitiveness to pressure over the course of all affected nerves. When near the surface, enlargement of nerves may be found on examination. Movement causes pain which prevents movement that could otherwise be made passively if not actively.

Early the knee jerk may be increased, but later on is abolished. The paralysis is partial and usually incomplete. The region of certain nerves will be paralyzed, others in the same member, not. Even where there seems to be a complete paraplegia careful examination will show certain zones unaffected. There will always be muscular degeneration. There will be incomplete reaction of degeneration with galvanism, more complete faradic reaction of degeneration. While the upper extremities may be affected by the paralysis, they are not nearly as frequently as the lower. The paralysis may be confined to the distribution of two or three nerves or to nearly all.

As to the sensory symptoms we may have zones of hyperesthesia, and anesthesia, or either. The soles of the feet are often very sensitive. There may be swelling of the joints from trophism. The bladder and rectum while often presenting abnormal symptoms, can not claim them from the neuritis. They are the result of some other condition, or pre-existed. Occasionally the girdle sensation will be observed. The memory is apt to be interfered with, it becomes treacherous, the psychological symptoms, however, I believe do not belong to the neuritis, but to alcoholism.

The oculo motor nerves are at times affected. Very occasionally the pupil will fail to react, and in some cases there has been found partial atrophy or a neuro-retinitis, central scotoma may be found. Bilateral facial paralysis has been found. The vagus and phrenic may be involved, in which case there is increased danger. Paralysis of the vagus will cause increased heart action, and the symptom of phrenic paralysis of the diaphragm.

Diagnosis.—Poliomyelitis has no pain and no sensory disturbance. In diffuse myelitis the bladder and rectum are involved, there is a tendency to bedsores and to cystitis.

In ataxia the history will frequently be all that is needed to differentiate; while in both the feet are raised high in walking, in ataxia the toes are raised and the heel strikes first, but in neuritis the toes fall and strike first.

Prognosis.—The prognosis is usually favorable. Recovery usually takes place in from three months to two years. Death does

occasionally occur. There may be deformities left permanently. The syphilitic and the mercurial cases may be of longer duration, but usually recover.

Treatment.—First, and of the utmost importance, is rest. I always put these patients in bed and keep them there, and in addition keep the affected members at rest. The next step depends on the cause. If from alcohol, remove this at once, and feed the patient frequently and thoroughly; treat as you would any alcoholic.

If from any other poison, treat accordingly. If from syphilis, give syphilitic treatment as recommended under that head.

If from infection, treat according to the lines laid down for the infectious diseases.

If rheumatic, the remedies indicated for the cause. See to it that every possible source of irritation is removed at once.

Galvanism as prescribed for neuritis, should always be used.

The heat baths may be very valuable in these cases, after the first acute stage is over. They are useful for elimination as well as in reducing the inflammation.

Various hot springs and magnetic waters have been of service. The mud baths of Indiana have been of great value in some of these cases. *Gelsemium* tincture possibly takes first rank early in these cases, especially if a tendency to paralysis is marked. I have found, in the prodromic stage where I had reason to believe from the history and the presence of paresthesias that a neuritis was impending, *Nux* and *Pulsatilla* to be excellent remedies. Whether they have ever aborted a case I do not know, but I have felt at times sure I would have a multiple neuritis develop, and after the use of these two remedies the case recovered. I use them together, the 1x of each in three-drop doses every two hours for two or three weeks.

Cimicifuga tincture in three- to five-drop doses every hour or two, when there are specially marked pains and aches in the legs, great restlessness and a lame soreness of muscles.

Argentum nit. (3x) and *Argentum chloride* (2x trit.) in the ataxic cases.

Arsenicum (3x to 30.) is a sheet anchor in a large number of severe cases.

Mercurius cor. (3x), *Merc. sol.* (2x), *Merc. iod.* (3x) are all likely to be indicated, not only for the symptoms but pathologically.

There is not a doubt in my mind but that the indiscriminate use of mercurial inunctions is responsible for many cases of multiple neuritis. I am sure that many cases ascribed to syphilis are due to the inunction of mercury.

Cuprum acet. (3x), *Plumbum* (30.), *Phosphorus* (30.), *Carbon bisulphide* (2x), are all remedies that have this pathological base, as well as the symptomatology, and will frequently be found fully indicated.

PERIPHERAL PARALYSIS.

Traumatic Paralysis of Peripheral Nerves.

Complete severance of a nerve trunk usually causes certain changes. The tendency is for the ends to separate, and disintegration to take place, both toward the periphery and the center. The severed ends do not usually unite. The changes in the end toward the center consist of degeneration of the connective tissue with proliferation and a possible nerve tumor on the stump. This process rarely extends far toward the center. The peripheral end tends to degeneration from the point of severance to its first distribution. If a nerve is only partly severed or its continuity partly destroyed, there will be simply injury to the myelin, from which there will be a rapid recovery; or the axis cylinder may also be affected. There will be degeneration through all the peripheral end beyond the point of injury.

The greater the break in continuity, the greater the resulting changes, and the less hopeful the case. There will follow muscular degeneration and various inevitable symptoms and conditions, and, of course, neuritis may be set up. If the injury is caused by compression, recovery is usually rather rapid. If the nerve is severed recovery will be very much slower or possibly never take place, unless the ends, in closing the wound, are sutured together. Regeneration is hastened in proportion to the vigor and vitality of the patient.

In very slight cases there is often no change in the electrical reaction. In the more severe cases there is likely to be for the first two or three days an increased excitability to either the galvanic or faradic current. It then becomes less, and is lost in about two weeks. Then there will be an increased galvanic excitability, with the reaction of degeneration, but no muscular response to the faradic current. If regeneration of the nerve does not take place, the galvanic reaction again decreases.

Symptoms.—The symptoms must depend on the severity of the injury, and on the function and the distribution of the injured nerve. Injuries occur to mixed more frequently than to special nerves. There will usually be flaccid paralysis, more or less complete, of all muscles supplied by the injured nerve beyond the point of injury unless some other motor nerve fibers in this region are intact, accompanied with loss of tendon reflexes, and later atrophy of the paralyzed muscles.

The sensory nerve filaments anastomose so extensively that frequently normal sensation remains, or there may be simply small zones of more or less complete anesthesia, or there may be incomplete anesthesia of the entire involved part. If there is a marked or extended anesthesia, the entire plexus, or certainly two or more nerve trunks are injured. There is quite likely to be slight increase in temperature and redness of the affected part, with a later loss of color and reduced temperature. Edema is often present. Trophic disturbances showing a lack of nutritive power, to skin, bones, nails and subcutaneous tissue as well as the muscles are quite frequent. There may be secondary muscular contractions.

Diagnosis. — In the paralysis resulting from joint injuries and fractures, where the nerve is not injured, there will be hardness and rigidity of the muscles, common sensory disturbances, and no reaction of degeneration. Scars in tendons and muscles, stiff joints and the many other mechanical effects of injuries may interfere with an early diagnosis, but the progress will clear it up.

Prognosis. — In mild cases, always favorable. In severe cases, must depend on the extent of the injury, the general condition and age of the patient, and the collateral injuries. The worst that is likely to happen is uselessness of the affected part. A neuritis may be caused, and extend toward and even into the spinal or cerebral center, and cause serious trouble.

Treatment. — If from compression alone, electricity is the remedy. *Arnica* (30.), and *Hypericum* (12.) are useful. If neuritis sets up treat that. In all cases rest of the affected part is important; be very careful not to impede the circulation by too tight bandaging. Galvanism is the form of electricity to use. The negative electrode, a rather large one at the seat of injury, and the positive over the plexus, from six to eight milliampères about three minutes, or it may in some cases, if seeming to give additional relief, be used much longer.

If reaction of degeneration be present, use the galvanism over the affected muscles as well. After from two to four weeks the faradic current should be used over the affected muscles,— a very mild current, no attempt at severe treatment should be made.

Massage should be used very gently and carefully, early; more vigorously later. If no external wound, it is advisable to apply hot arnica packs over the injured part, but never if any external wound. Hamamelis may be used in that case if thought advisable, to relieve pain or arrest inflammation.

In all cases of injury everything that can produce pressure or in any way interfere with a nerve trunk must be corrected. If an open

wound, the nerve should be sought for; and if severed, the two ends sutured together; or if badly lacerated, the lacerated portion removed and the free ends sutured together. In old long-standing cases the advisability of cutting down into, and suturing together the separated ends must be considered, as also the excision of a diseased or degenerated portion or of a nerve tumor. Muscular transplantation has been practiced, in a few old cases.

PERIPHERAL PARALYSIS OF SPINAL NERVES.

Paralysis of the Phrenic Nerve.

Etiology.—Fractures and dislocations of vertebræ. Diseases of the vertebra; meningitis of any character. Possibly, but very rarely from tumors or injuries to the neck. A purely neural palsy may result from infection, rheumatism or toxemia.

Symptoms.—Dyspnea on slight exertion may be very pronounced and even dangerous. Inaction of the diaphragm; as a result the sinking of the diaphragm on inspiration is absent, and the lower border of the liver is not normally prominent. On expiration, the lower border of the liver is prominent and the abdomen full. The respiratory murmur at the base of the lungs will be feeble. The electrical reaction may be lost for both galvanism and faradism. It may be unilateral, or bilateral. If unilateral, it will require careful examination to detect.

Prognosis.—Usually favorable. Depends on the possibility of removing the cause. If in course of multiple neuritis not favorable.

Treatment.—Remove the cause. Use central galvanism and faradism. Following diphtheria strychnia is recommended. I have had the best results from the (30.). Other remedies must be selected according to the cause.

Paralysis of the Brachial Plexus.

It is often impossible to differentiate between affection of the root and of the plexus. The whole plexus may be involved or any one or more nerves. It may be of traumatic origin—from injury or luxation of the shoulder. Tumor in the clavicular region. It may be toxic, infectious or rheumatic.

Involvement of the entire plexus is always traumatic, and is very rare. The most common traumatisms are sub-coracoid or axillary dislocations. Fractures of the humerus or clavicle, hemorrhage, tumors in the axilla, and from delivery.

There will be a flaccid paralysis of all muscles supplied by the

plexus. In most cases, however, there will be one or two nerves unaffected. Varying sensory disturbance will always occur. Atrophy to some extent will follow.

There is rarely entire recovery.

Combined Paralysis of Shoulder and Arm.

Commonly known as *Erb's Paralysis*, always affects the deltoid, biceps, brachialis internus, and the supinator longus. Occasionally the infraspinatus. It is caused by injury direct to the plexus, such as is most likely to occur during forcible movement of the arm outward and backward when elevated. This may occur during birth. It may result from carrying heavy burdens on the shoulders. Toxemia, infection at times or rheumatism may produce it. The arm cannot be adducted, cannot be flexed at the elbow, and there may be pronation of the hand without the power of supination. There may or may not be pain. There may or may not be any marked sensory symptoms. Treat as in neuritis.

Paralysis from Disease of Lower Plexus.

The eighth cervical and first dorsal roots are the ones involved. It may be caused by anything that can produce pressure on these roots. It will be included in a total plexus paralysis.

The muscles paralyzed are the small muscles of the hand and mainly the flexors of the forearm. Normally, there will be sensory disturbance in the ulnar region, and the inner surface of the entire arm.

Obstetrical Paralysis.

This, as the name implies, occurs from accident or mismanagement in delivery. In head presentations the finger is slipped in the axillia and hard pulling causes pressure on the brachial plexus, or the shoulder may be forced upward and backward. In an effort to free an elevated arm, either with an instrument or the finger, sufficient pressure may be produced. It may be caused by the forceps.

The hand will be pronated, the arm extended, and the humerus rotated inward in a majority of the cases. This combination is quite common in breach presentations. Obstetrical paralysis is usually unilateral. The prognosis is nearly always good. Complete recovery occurs in a very short time. Very gentle faradism and *Arnica* (30.) internally are the only remedies required.

Paralysis of Individual Nerves.

These paralyses occur under like conditions and from the same causes. The symptoms are modified by the area of distribution mainly. By reference to the function of the various nerves the diagnosis can easily be made out. The treatment of all is the same. A modification of that suggested for neuritis.

PERIPHERAL PARALYSIS OF THE NERVES OF THE LOWER EXTREMITIES.

These nerves are much better protected from injury, and therefore while we do have occasional traumatic cases, they are not nearly so common as of the upper extremities. In fact, peripheral paralysis of the lower does not occur nearly as frequently as of the upper extremities.

The causes otherwise are the same. I have seen several cases as a result of abdominal and pelvic tumors, and one case from aneurysm of the femoral. There is inability to flex the hip or extend the lower leg. If only the leg is affected the patient must exercise great care to avoid bending of the knee. If both legs are affected, the gait will be very marked. There may be either hyperesthesia or anesthesia in lower two thirds of the anterior and inner surface of the thigh, in inner side of the leg and foot. The knee jerk will be absent. Atrophy of muscles always follows.

PERIPHERAL PARALYSIS OF THE CRANIAL NERVES.**Peripheral Paralysis of the Nerves of Ocular Muscles.**

In much the larger number of ocular paralyses the lesion is central. There may occur true peripheral paralysis of these nerves from various causes. Exposure to cold, traumatism, a growth in the orbit, and occasionally infection. Syphilis may be the prime factor. It may follow diphtheria.

If all the oculo-motor nerves are affected, the lids will droop so as to cover the eye, and cannot be raised voluntarily except very slightly, and that by strong effort of the occipito frontalis. The ball may be moved outward, but in no other direction. If an attempt is made to move it at all, it will go outward and downward. After a time the eye will remain constantly in this position. The pupil does not contract to light (nor in sympathy with its opposite, when only one is affected), but is of normal size. There may be some bulging. There will be

double vision in the entire field. There may be pain, but not always. When present, there is probably compression, or possibly a rheumatic element. There may be incomplete paralysis, or part of the muscles only may be involved.

General paralysis of the ocular muscles is complete or incomplete, but includes all of the muscles. If there is a bilateral or unilateral paralysis affecting only a part of the muscles, the trouble is probably muscular. If adjacent cranial nerves are affected, it is indicative of peripheral lesion.

The *prognosis* depends on the cause, and on the possibility of its removal.

Treatment.—First remove the cause if possible. If not surgical, give treatment adapted to the cause. Glasses in which one is ground so as to obscure the vision should always be worn. Galvanism, the negative electrode over the closed lid, the positive at the back of the neck, once a day, for about two minutes, from two to three milliamperes.

Where there is no compression, strychnine sulph. may be of benefit, one sixtieth grain hypodermatically three times a day except in post diphtheritic cases, where I know not why, I have had better results with the 30.

The physician will occasionally meet a case in which, at more or less regular intervals, there will recur attacks of oculo-motor paralysis more or less complete and general. At first there is apparently an absolutely normal condition during remission; later, this is not so. Nothing seems to be known as to the cause or pathology. If it is progressive, the chances for recovery are small; if not, they are very good. Treat as in ocular cases, except that remedies adapted to the periodicity present, seem to have a decidedly favorable action.

Paralysis of the Trigeminal Nerve.

The main reason for mentioning this condition is to draw attention to the fact that it is exceedingly rare. Whenever a case of paralysis in the distribution of this nerve occurs, the first supposition must be that it is of central origin, and only when it cannot be made out so, should the peripheral diagnosis be made. When it occurs it is most frequently traumatic. The traumatism may be to the face, or in the orbit or at the base of skull. Injury occasionally occurs in facial operations. In either the operative or traumatic cases it is usually only one or two branches of this nerve that are involved. It is possible to have a true paralysis of this nerve from a neuritis, or it may be the result of rheumatism.

If the entire nerve is involved, there will be anesthesia of the skin throughout its entire distribution and over the mucous membranes of the conjunctiva, cornea, nose, mouth, tongue, cheek and gums. The secretion of tears is lessened on the side affected. There will be dryness of the nose, throat and mouth, and the sense of smell will be lessened. The mucous membranes are not sensitive to pungent substances. The patient often bites the cheek. In putting any hard substance in the mouth, he feels as if only half of it were there because he feels it on one side, and does not on the other. Taste may or may not be affected. Herpes is quite common. There will be other trophic disturbances as well, such as ulceration of the cornea, and of the mucous membranes.

If the anterior root is affected and the third branch is affected, there will be motor paralysis of the masseter, pterygoid and the temporal, with the reaction of degeneration and lowered electrical reaction. In some cases atrophy will commence late.

If there is only one or more branches affected, the same general line of symptoms will be present, but confined to the distribution of the affected branches. The symptoms are not likely to be quite as complete. If there is not entire destruction of continuity, but simply pressure, the symptoms will be incomplete; that is, less marked.

Prognosis. — Must depend on the cause and the severity.

Treatment. — First remove the cause if possible. Treat the conditions producing it. If you can find nothing else, it is wise always to treat on a syphilitic basis.

The galvanic brush with a light current will often be useful, the positive pole at the back of the neck and the brush attached to the negative pole over the affected skin and mucous membranes. Each application should last about five minutes, and be employed daily.

Facial Paralysis (Prosopoplegia).

Facial paralysis occurs in connection with other diseases. These may be in the brain, the meninges, or be of nuclear origin.

The most frequent form of peripheral facial paralysis is known as *Bell's Palsy*.

Etiology. — More often occurs in males. It is rarely the result of syphilis. A few congenital cases are reported. It may be caused by the forceps in delivery. Traumatism and exposure to cold are causes. It may be rheumatic. Is more frequent in the temperate climate and in cold seasons. Not infrequently it is due to disease of the ear, especially the middle ear. It may be due to disorders in the teeth. I

have seen two cases promptly cured by digging out and removing hidden wisdom teeth. It often follows an influenza.

Pathology.—An inflammation usually attacking the nerve endings, and traversing the entire nerve in its course. The inflammatory signs are often most marked at the periphery, but in some cases the middle or central portion show the greatest change.

Symptoms.—Comes on rather suddenly as a rule, and progresses to its full development in at most two or three days, may be in a few hours.

There may be a little pain preceding the attack. The face on the affected side will be smooth, the corner of the mouth lower than the opposite; the mouth will be crooked, being drawn toward the sound side; the tongue will appear to be protruded, bending toward the affected side, but in reality straight. In smiling, laughing or in attempting any facial expression the sound side will be natural or nearly so, while the affected side will remain entirely or nearly flaccid. There is no expression to that side. The patient literally laughs or cries on one side of his face only. The patient will be unable to close the eye on the affected side, there will be no wrinkles at the corner on attempting to do so. The eye on the affected side is likely to be watery. If there is increased sensitiveness to sound, the disease has probably extended well up into the Eustachian tube. If there is loss of taste, the part between the chorda tympani junction and the geniculate bodies is affected. These symptoms of taste and hearing will enable an exact localization to be made. There will be partial reaction of degeneration. For the first few days there will be increased reaction to both the galvanic and faradic currents. This will gradually diminish as to the faradic, but not for a considerable time as to the galvanic. After five or six weeks faradic action begins to reappear. In two or three months if not cured, secondary contracture begins, and after a time the mouth will be drawn to the affected side. There will be after a long time excessive movement on the affected side in laughing and the like.

Diagnosis.—Unless in small children there is no difficulty in deciding which is the affected side by very little observation. If it is a cerebral paralysis, the patient can close the eye, and the upper branch will be very little implicated. There will be no reaction of degeneration.

If of nuclear origin, there will be a history of diphtheria, or lead poisoning, other evidences of bulbar paralysis, or implication of other cerebral nerves.

If at the base of the brain, the auditory and other cranial nerves will be involved, or there will be evidences of cerebral syphilis.

Prognosis.—Usually good, but many times recovery is not quite complete. The usual duration is from five to eight months. In syphilitic cases the prognosis is not nearly so good.

Treatment.—As in all cases of neuritis, rest of the affected muscles is an absolute requisite. I must indorse the caution against any unnecessary handling or manipulation of the affected parts, so forcibly given by Bartlett. Lint, or absorbent wool by preference is to be placed over the entire side of the face, and held in position for one or two weeks. It may then be removed in order to commence galvanism. Insist to the patient and friends that there is great danger of doing too much rather than too little. Here you are justified in saying that you know what you are about. Place the positive electrode over the various motor nerve points, and the negative over the point of emergence of the nerve (I am fully-aware that I am reversing the usual mode of procedure), increase the current very gradually to two or three milliamperes, hold about three minutes, and decrease very gradually. Give daily treatment for one week. Then the positive pole stationary over the point of emergence, and the negative at the various motor points interrupting the current within the metallic circuit. Use the lightest current that will cause contraction in the affected muscles, apply at each point about one minute, and interrupt four or five times. Give this daily. The eye must be protected by some means. The internal remedies are the same as those suggested for neuritis.

Paralysis of the Glossopharyngeal Nerve.

The principal sources of disease in this nerve are inflammations, tumors, especially syphilitic, and aneurysms. Interference with the jugular vein may implicate this nerve.

There will be anesthesia of the upper half of the pharynx, loss of the sense of taste on the posterior half of the tongue, and difficulty in swallowing as a result of paralysis of the pharyngeal muscles. The pharyngeal reflex will be abolished.

Treatment.—The removal of the cause, when possible. Treatment directed to the concomitant conditions. In the very few cases where it seems to be largely a primary disease, *Lachesis* (12.) is the remedy.

Paralysis of the Vagus Nerve.

Etiology.—Is nearly always the result of disease in tissue, contiguous to it in some part of its course. It may be rheumatic or appear in the course of multiple neuritis. Is frequently affected in post diphtheric paralysis, Typhoid fever, pneumonia, scarlet fever, malaria, cholera,

and influenza are often causes. Alcohol, lead, arsenic, atropine and morphine are prominent toxic agents in its causation.

Various conditions at the base of the skull may interfere with this nerve within the cranium. Circulatory disorders in the brain, especially of the vertebral and inferior cerebral arteries, thrombosis of the transverse sinus, or of the jugular vein may produce it. Tumors, wounds or operations in the neck, may press on or injure this nerve. When symptoms referred to the vagus are present, in anemia or functional neurosis, they are of central origin if organic.

Symptoms. — If unilateral, and the lesion is at the base of the brain, there will be paralysis of one side of the larynx and pharynx. The palate will hang loosely, even during efforts to speak. There is a nasal twang to the speech, but swallowing is very little interfered with. The vocal cords do not move in attempt at phonation but remain in the median line. Practically the same conditions are present from injury high in the neck.

Respiration may be increased, or decreased, or irregular. Respiratory symptoms are not constant. Aspirative pneumonia may be caused by this paralysis.

To differentiate from disease at the base of the brain affecting this nerve, there will always be evidences of disease in other cranial nerves.

In paralysis of the recurrent laryngeal, the vocal cords will remain in the cadaveric position. The voice will be hoarse and harsh. If bilateral, aphonia and dyspnea will be present.

Treatment. — *Electricity* is probably one of the most useful remedies. The *galvanic* only early in the case. No matter how acute, or severe the case may be, this remedy should always be used. The positive pole should be placed over the back of the neck, using a large flat electrode bent to fit. The negative pole, with an ordinary small electrode should be placed at the angle of the jaw and neck at the side of the larynx and moved slowly down along the side of the larynx to the clavicle. Whether the case be uni- or bilateral apply to each side in alternation. Use from two to three milliamperes early in the case, later may use a much stronger current. Then at the same time use ordinary small electrodes, on each side of the larynx, as high as the chin will permit, and draw slowly down to the clavicle, then reverse the electrodes, and draw them down again, in the same manner. This will usually produce the motion of swallowing. If the case is very acute, it is not advisable to use more than two or three milliamperes; if only subacute, a current sufficient to produce the swallowing motion may be used. Each part of this treatment should not last over three minutes.

Direct application to the mucous membranes may in some cases be advisable, but should never be undertaken except by an expert.

Faradism may be used in the same general manner, and is highly recommended by some authors. I have, in functional disorders, hysterical or neurasthenic cases, used this current with benefit, but in all others I doubt its utility. *Massage* is also an important element. This should be given in the form of general massage, and in special manipulation of the anterior part of the neck.

The patient should not undertake to use the voice beyond absolute necessity. *Lachesis* (12.), *Rhus tox.* (3x), *Causticum* (3x and 30.), *Phosphorus* (30.), are the remedies most likely to be of service. Of course in a large number of these cases the producing disease is to be treated, rather than this symptom.

In the hysterical and neurasthenic cases, *Ignatia* (30.), *Nux vom.* (3x), *Zinc phosphide* (3x) and like remedies will be indicated.

Paralysis of the Accessorius Nerve.

Etiology.— This may be caused by disease of the cervical cord affecting the roots, or of the cervical vertebra; by tuberculosis or syphilis, producing an irritating exudate in the foramen magnum. By tumors or traumatism. There are cases which, at present, must be considered as resulting from an idiopathic neuritis of this nerve. It may occur on one or both sides.

Symptoms.— The sternomastoid and trapezius muscles will be incompletely paralyzed. If bilateral, it is difficult to hold the head up, it will be inclined to fall backward, and it can be bent only with difficulty. If unilateral, the head and chin can not be readily turned to the opposite side. A fuller description of these symptoms will be found under the head of the functions of these nerves. Reaction of degeneration is often present.

Prognosis.— Depends first on that of the disease producing it. In the so-called idiopathic cases there is a tendency often to progression in intensity. If this progression can be corrected early, or arrests itself, early recovery may be expected.

Treatment.— Galvanism and faradism always, as suggested in other peripheral paralyses. The general line of treatment for neuritis, modified according to the location, and directed to the producing disease.

Paralysis of the Hypoglossal Nerve.

Etiology.— From bulbar and intracranial lesion. It is nearly always a factor, but without atrophy of the tongue in hemiplegia. It is also present with atrophy of the tongue in disease of the medulla.

A peripheral disease of this nerve may be caused by tumors at the base of the skull, disease in the posterior cranial fossa, aneurysms of the vertebral artery, dislocation of the upper cervical vertebræ, and hydatid cysts. Traumatism and operations may also be causes. Occasionally a congenital atrophy of the tongue is found, or may appear with multiple sclerosis, tabes, or syringomyelia.

Symptoms. — As the tongue lies quietly on the floor of the mouth, the tip is likely to point somewhat toward the sound side, but when the tongue is protruded, the tip will turn toward the affected side; if unilateral, there is difficulty in moving the tongue inside the mouth. The extent of the deviation depends on the completeness of the paralysis. Atrophy follows quickly, with a fine tremor of the tongue. The tongue, if only one side is affected, will be narrower and smaller on the affected than on the opposite side, and will have a shriveled or wrinkled appearance. The reaction of degeneration will only be partially present. There will be very little difficulty in talking or swallowing. However, if the trouble is on both sides, there will be marked affection of the speech and in swallowing. The symptoms as described for one half will be simply present in both halves; of course, the deviation of the tip will not be present and there will be difficulty or entire inability to protrude the tongue.

The *prognosis* of this peripheral paralysis is good. If of central origin it depends on the cause.

Treatment. — The same as for other peripheral paralyses.

NERVE TUMORS.

Neuroma, syphiloma, glioma, sarcoma, fibroma, and myxoma may appear in or on nerve cords. They preserve the same general characteristics as when found in other tissues. Nerve tumors may be single, or there may be a large number of them on a single nerve trunk. They may be confined to one nerve trunk or affect many trunks.

Pain is the chief characteristic. A long-continued, increasing, severe pain, with tenderness on some point on pressure, without any other indications of neuritis, and more constant than should be in neuralgia, will be sufficient to arouse suspicion. If on or in a nerve trunk lying superficially, palpation will usually reveal the tumefaction. While in most cases no other symptoms except the general conditions produced by the particular oma, there may be symptoms of pressure in the affected nerves. Marasmus occurs rather frequently as a result of the pain. The tendency is to progress, but at times the growth is arrested. No danger to life except from the character of the growth and from marasmus.

Treatment. — Remove if possible. It will nearly always become necessary sooner or later to use the hypnotics or narcotics. The same general precautions and rules apply as in other cases where this becomes necessary.

The syphilitic may be treated successfully by the methods suggested for that disease.

ACUTE ASCENDING PARALYSIS. LANDRY'S PARALYSIS.

This disease stands to-day with a clear-cut, well-defined picture, suggestive of grave pathological changes, but without any real knowledge as to such changes. Various authorities have found anatomical changes in the gray matter in the cord, in the medulla, or in the peripheral nerves, but as yet no uniform changes that we can say belong to this disease. It has been called a central myelitis. It may be. To-day we do not know.

Etiology. — Poison is the etiological factor. There can be no doubt that various toxins or bacteria are the prime factors in its causation. It may develop after typhoid fever, pneumonia, influenza, diphtheria, whooping cough, child birth, gonorrhea, anthrax and smallpox, and also after septicemia. Then we have cases in which we have been unable to find any bacterial origin or source of infection, and yet in some of these cases the bacteria have been found at the post mortem. Alcohol is claimed to cause it. Syphilis also, but I doubt very much whether it can be considered an etiological factor. There is no pathology.

Symptoms. — A patient possibly in apparent perfect health. This is not always the case, however. The patient may be weak from some preceding disease, or exhausted from an exertion or worry. There may be a general bad feeling for a few days, with unnatural sensations in the legs. The onset, however, appears to be rather sudden. There is paresthesia in one or both legs, with (motor) paralysis commencing at the feet, and spreading rather rapidly upward to the body and continuing up the trunk. Within one to three days there will be very little pain except possibly to pressure or passive movements. Sensation is interfered with, but rarely if ever abolished. The paralysis is flaccid and the knee jerk gone. In a full typical case the paralysis moves regularly from the region of one segment to another upward till the bulb becomes affected. Thus the feet, legs, pelvis, abdomen, chest, arms, throat and mouth are successively paralyzed. In most cases both sides are affected nearly alike. Occasionally the progress will be somewhat more rapid on one side. Then again one or two segments may be very

much less affected than those above or below; this may be on one side or both. All the usual signs of paralysis of these various regions will be present, including difficulties in respiration, deglutition, speaking and the like. The upward progress may be arrested at any point and possibly retrograde in simple reverse order. When this occurs, there will be a long, tedious convalescence. Occasionally the trouble seems to commence in the bulb; if so, death ensues very quickly.

No atrophy has been observed in these cases. The reaction of degeneration is present. There is a loss of muscular reaction to the electrical current. A waxy muscular degeneration has been found in some cases. The bladder and rectum are not implicated. As to febrile symptoms, they may or may not be present. The mind is usually clear, unless there are general indications of sepsis.

Prognosis. — A majority of these cases die within a few days, occasionally there will be slow progression and death after some weeks. If the progression stops short of the bulb, the chances are better. In general, the earlier that arrest and retrogression commences, the better the prognosis.

Treatment. — *Gelsemium* tincture, three to five drops every two hours, should be given if the case is seen very early, and in alternation with *Chinin. arsen.* (2x trit.). The *galvanic* current downward to the spine for ten minutes every two hours for the first twenty-four hours; use from eight to ten milliampères. *Conium mac.* tincture in from five- to fifteen-drop doses may next be indicated. I have thought that I saw decided results from this remedy. In one case that recovered completely, the physician in attendance had simply poured whisky down the patient. When I saw him he was very drunk. I have never been quite satisfied whether the whisky saved the patient or not.

If arrested and retrogression occurs, a modification, such as will materially suggest itself, of the treatment for multiple neuritis.

NEURALGIA.

Neuralgia is a pain in a nerve, nothing more, nothing less. It has no known pathology. Wherever a pathology is discoverable, it ceases to be a neuralgia, and should become known by that pathology. It is possible that there is from some source interference with metabolism in the neuron, or it may be that there is simply an increased or irregular vibration in the nerve trunk. It is nearly always irregularly paroxysmal, though sometimes periodical to the minute. The pain follows the course of a nerve and its distribution, or may be confined to one small spot.

Neuralgia is uncommon in young children, but may appear at any age.

The causes are beyond enumeration. In many cases there is no possibility of arriving at a cause.

There is nearly always a predisposition to nervous trouble either hereditary or acquired. Anything that depletes the general system, strength or power of resistance may produce susceptibility. Traumatism of various forms, or infection may also be considered among the causes. Digestive derangements, either the stomach or intestinal tract; constipation; in short, almost anything may predispose or produce neuralgia.

Reflex irritation is a very great factor in producing it.

Symptoms.—Pain is of course the only real symptom; others result from the pain.

This pain may be of various kinds, sharp, boring, cutting, burning, etc. It always comes on in paroxysms, with intervals of practically absolute freedom. In those cases in which there seems to be slight discomfort or pain continuously, there will be decided exacerbations. The attack of pain may occur without any immediate cause, from movement of the affected member, pressure, air striking the part, a touch, emotional disturbances or other things. There is no paralysis, although in some cases there is inhibition of motion on account of or from fear of pain.

Vasomotor and secretory disturbances of almost any kind may accompany it.

Sensory disturbance may occur in the form of a hyperesthesia over the affected part, particularly to slight touch, even of a feather, a gentle breeze, the clothing or the finger. On the other hand, as a general rule, deep firm pressure will not aggravate, and may give decided comfort.

There are, in some forms, muscular twitchings. The pain is usually in the main trunk of the nerve, but may be in any branch. When in the main trunk, it is quite likely at its height to pass into all the branches.

In certain cases there will be tenderness on pressure at the point of exit from bone, or where the nerve can be pressed against a hard substance.

After a long continuance, the general health is likely to be impaired. The mind may become affected; the usual tendency is to melancholia; there may be even suicidal tendencies.

Diagnosis.—The only condition with which it is likely to be confused is neuritis. There are cases in which a differentiation cannot be

made. But in neuritis there will usually be pain increased by deep pressure, the pain will be continuous with aggravations and there will be motor and sensory conditions present.

A diagnosis cannot be said to have been made until every possible cause has been canvassed, and every possible source of irritation has been examined for; that is, the diagnosis must include the cause if possible to find it.

Pain, and of a general neuralgic character, so frequently occurs in the course of other diseases, that it will often be found necessary to determine whether, when any disease is present, the pain is due to it or to an accompanying neuralgia.

Prognosis.—This must depend to a considerable degree on the cause, the age and the general condition of the patient. Neuralgias have a decided tendency to hang on; are usually quite irregular; there may be very frequent attacks, and then a long intermission, it may be for years. In general, however, the prognosis may be considered as favorable.

Treatment.—A complete quantitative analysis of the twenty-four hours urine should always be made. This will frequently lead to the special defect of nutrition present and to a successful line of treatment. Treatment looking to making the excretion of urine normal, should always be considered.

A blood analysis should also be made, and whatever of the abnormal found, corrected if possible. The digestion must be carefully looked after; a stomach analysis must be made if serious digestive disturbances are present. The condition of the intestinal tract should be investigated. Many times I have had long-continued, persistent neuralgias in various parts of the body recover promptly after cleaning out loaded colons. Either one of the colons may be the seat of the trouble. The rectum, sigmoid and lower part of the descending colon must be carefully examined, and any trouble corrected. The genital tract must be examined very carefully with the fact constantly in mind, that very slight irritation may cause severe and far-reaching trouble in almost any part of the anatomy. Adherence of the prepuce, a too long prepuce, a small external meatus, hooding or adhesions of the clitoris, the vaginal opening being insufficient to allow free drainage, irritable hymenial tabs, lacerations or erosions of the cervix or cervical canal, cicatricial plugs even at the internal os, malposition and various forms of inflammation, ovarian disease, urethral disturbances, may any of them be sufficient sources of irritation. The eye conditions must also be scrutinized carefully; in short every part of the body. Whatever the possible source of irritation, it must be corrected at once.

Great care must always be taken to have full nutrition, not simply a great amount of nourishment, but it must be made to transpose into fat and tissue.

One source of neuralgia, the pinching of a nerve fiber in a cicatrix, must not be overlooked. If such be the case, it must have surgical attention at once.

The application of heat or cold for the immediate relief of pain is always advisable. Use whichever gives relief. This may also be used for its permanent curative effects. It may be applied in any of the numerous ways. It may be in the form of dry or moist heat. In those cases in which there is supposed to be a toxic or infectious cause, eliminative baths should be used, and if necessary to the point of the most profound effects in the way of febrile disturbance.

The gymnasium is often a valuable means in the cure. The exercise should be very regular, and combined with it must be correct breathing exercises. Exercise in the open air when possible should be encouraged.

Anodyne ointments without number have been prescribed and used often with good results. The fact that any one or all of them have failed in many cases is not a good reason for refusing to use them.

Counter irritation may be essential, and no prejudice against this mode of treatment should be allowed to prevent the patient from receiving the benefit that may result, in old and persistent cases. The actual cautery may be used at times.

Electricity stands among the most valuable remedies. The galvanic current will be most frequently serviceable. The positive electrode should be placed on the point of pain, the point of exit of the affected nerve, or a point tender to pressure. The current should be turned on and increased slowly from one to two milliamperes, held at that for five to ten minutes unless it increases the pain, and then very slowly reduced in strength before removal of the electrodes. After having used it in this way for a time, the strength of the current may be increased. In many cases the best results are obtained by slowly increasing the current to a point at which it aggravates the pain, holding it at that point a minute, and then reducing the current slowly. I believe in long-standing cases that better results are obtained by being very regular as to time of day, length of treatment and every detail.

The faradic current may sometimes be of greater service. The same rules apply in its use.

Here the static current has proved itself to be efficacious. It may be used in various ways. The metal-lined glass electrode placed over the affected nerve has been used with marked success with this current.

Electro-puncture should be resorted to in case all other means fail.

Massage is to be considered carefully, not only massage as ordinarily understood, but combined with it manipulations of special character over the affected nerve and its distribution, and also passive movements of the affected member.

A change of climate at times seems advisable. As to the kind of change that will benefit any individual case, no one can tell.

Surgical measures, such as excision of a portion of a nerve trunk or stretching, have been practiced successfully many times, and should always be thought of as a final resort. The probable other results of severing the nerve should be carefully considered. The use of internal medication may be for simple relief or for cure.

I feel obliged to call attention to danger arising from the use of hypnotics, narcotics and analgesics in any long-continued, painful condition. Neuralgia is probably responsible for more drug habits than all other diseases combined. The very fact that the patient has a long-continued neuralgia, is evidence of susceptibility to habit. I am sure the world would be much the better if there was no such drug used in neuralgia. That there would be increased individual suffering there can be no doubt. The increased suffering in many ways mentally and physically of so great a number, as there are from various drug habits, or as the result of various drugs, far outweigh, I am sure, this increased individual suffering.

Believing this, I do and must continue to use these drugs in some cases. I have not the heart nor the courage to see such suffering as is sometimes encountered in neuralgia, be unable to arrest it with other means, know that I can give relief and not do it. The patient will not permit, nor will the patient's family and friends. They feel that they must have relief, and that I must give it to them. There are cases, too, that will baffle the skill of any physician, and when he can find nothing else to do, he must give relief.

Opium in any form must be the last to be used. The increased mental and physical suffering caused by this habit must be avoided if possible. When it must be used, all the precautions mentioned in other chapters must be observed.

Sodium Salicylate in from five- to fifty-grain doses every two hours.

Salol from fifteen to twenty grains in a day.

Salipyrin from fifteen to twenty grains in a day.

Gelsemium tincture three- to ten-drop doses every hour to four hours.

Cimicifuga tincture ten to fifteen drops every two hours.

Aconite root tincture one to three drops every hour or two, watching the general effects carefully.

Oil of turpentine from five- to fifteen-grain doses three or four times a day.

The *coal-tar* preparations in full doses.

Antikamnia in five- to fifteen-grain doses three or four times a day.

The *bromides* in solution in full doses, either alone or in combination with *chloral hydrate*.

Hyoscyamine hydrobromate, by the mouth, one-fiftieth grain, repeating in an hour if no relief; must watch carefully not to get too much narcosis, or the exciting effect either; or one one-hundredth grain hypodermatically.

Duboisine in the same doses and with same precautions.

Quinia sulph. — This drug is without doubt curative in many malarial cases. Whenever a neuralgia presents a marked periodicity, this drug may be called for. It may be given in from one- to two-grain doses and repeated every hour to four hours. In the larger doses it cannot of course be continued for so long a time as in the smaller doses. There are cases, however, in which a few doses of even twenty grains will have a decided effect when two- to three-grain doses will have no influence whatever. This is a drug in which the dosage is nearly as important as the selection of the remedy.

Arsenous acid in the form of Fowler's solution in from four- to six-drop doses, every four hours.

Cannabis ind. — Squibb's tincture in from three- to five-drop doses every four hours, watching for the mental symptoms.

Strychnia sulph., $\frac{1}{80}$ grain dose every four hours in cases in which there is evidence of muscular irritation.

The drugs here mentioned are only a few of those that have been recommended. They are, however, in my experience, the most likely to give relief, and with the least possible harm.

I now desire to call attention to a fact that, while it may be necessary, at times, to use drugs as suggested here, the careful homœopathic prescriber will have much more prompt and more frequent cures, than the physician who depends alone on that line of treatment. I say with emphasis that careful affiliation of the homœopathic remedy is by all means the most satisfactory for the patient as well as for the physician.

In many cases the method of prescribing for the totality of the patient, rather than for the special manifestations, will give the best results. It is impossible, in the space allotted to me, to give the special indications for the remedies in this condition. I will simply name a

few, that in my hands have seemed to be most frequently indicated: *Aconite*, *Arnica*, *Argentum nit.*, *Arsenicum*, *Aurum*, *Aurum et Sodium chloride*, *Belladonna*, *Bryonia*, *Bovista*, *Calcarea carb.*, *Calcarea phos.*, *Cicuta vir.*, *China*, *Coffea*, *Chamomilla*, *Cimicifuga*, *Caladium*, *Causticum*, *the Ferrums*, *Gelsemium*, *Hepar sulph.*, *Heleborus niger*, *Hyoscyamus*, *Ignatia*, *Ledum*, *Lycopodium*, *the Mercuries*, *Nux vom.*, *the Natrums*, *Magnesia phos.*, *Nitric acid*, *Phosphorus*, *Pulsatilla*, *Petroleum*, *Staphysagria*, *Veratrum alb.*, *Veratrum viride* and *the Zincums*.

I rarely use these remedies except as mentioned in the previous list lower than the 30x in the treatment of neuralgia. In this disease I am inclined to the belief that the middle ground does not give the best results, that it is better to give very large or very small doses, with a decided preference borne, I believe, of experience, for the higher potencies. I am sure that I have had unquestionable curative effects from even higher potencies than the 30.

In the cases in which syphilis has been contracted, the suggested syphilitic treatment seems at times to be all that is required. For the neuralgic pains in cerebral syphilis, *Stilingia* tincture, three- to ten-drop doses every half hour.

NEURALGIA OF THE TRIGEMINAL NERVE.

Synonyms. — Tic Douloureux, Prosopalgia.

Etiology. — The most important factor, and not infrequently the only cause, is the neuropathic temperament. It is quite possible that the mouth is one, if not the greatest, source of this form of neuralgia. There are many conditions occurring in the mouth that may cause pain. Attention should be called particularly to the teeth and the jaws. Any diseased condition in these, capable of causing irritation, may cause pain in one or more branches of this nerve. Crowding of the teeth is often found. The wisdom teeth are great offenders, they may crowd after coming through, or there may not be room for them, and the crowding occurs underneath the gum. Disease in the antrum, in the frontal or nasal sinuses, in the nasal cavity, or a spicula of bone in the nasal passages, are all etiological factors in this disease. The ear, too, has its share of responsibility and causes many cases. Constriction in any part of the different bony canals through which this nerve passes will cause the trouble. Exostoses in the canal or at the point of exit, or swelling of the periosteum may be the source of irritation. Any diseases of the eye, or eye strain alone, may be the cause. Malaria and infectious diseases, are sometimes followed by this form of neuralgia. It may result from traumatism or from exposure to cold and wet, and

it may be toxic. There is no doubt that the immediate cause may sometimes be found in reflex irritation in distant organs. There are also many cases in which the seat of the trouble is within the cranial cavity. In aneurysm it is really a central disease. Aneurysm is also to be considered as a cause, especially those of the internal carotid.

Symptoms.— It is exceedingly rare to find this diseased nerve affecting both sides of the face, except in diabetes. One branch or two, or all may be affected. It is in most cases confined to one or two branches. The pain may at first cover a considerable area, and later be confined within much narrower limits, or again the direct opposite may occur. The character of the pain deserves special mention. It is in a large number of cases simply agonizing. It is a tearing, wearing pain. It is a horrible pain. It is described as though an auger were boring into the spot, or a dirk plunged in and turned around, as though a red-hot iron were piercing the flesh, or as if a thousand bees were stinging in one place. In fact no language seems adequate for its description. It is a fact that the physician will meet many cases in which the pain is not of so intense a nature, in which it is bearable, in which the patient is not wholly engrossed with this pain. Like all neuralgias, the pain is not constant. There are usually absolute remissions of varying periods of from a few minutes to a month. In many cases there will be distinct attacks every few seconds or minutes for days at a time, and then occasional exacerbations in which all the branches will be affected, and occasionally other nerves as well.

There is frequently increased secretion from the eyes, the nose and the mouth. There may be swelling of mucous membranes or of the face. Herpes especially may occur. There may occur changes in the eye and ear of various kinds. It is claimed that atrophy of the muscles on the affected side of the face occasionally occurs, but these cases are not true neuralgias.

In those cases that are most properly diagnosticated as *tic douloureux*, there will often be certain tender or pressure points; that is, there will be certain points at which the slightest touch of any kind will always produce very severe pain at once. Many of these patients must keep that side of the face protected from the slightest draft, they cannot allow even a thin veil to touch that side of the face. Mastication of food cannot be borne. Every movement means agony. Even in cases where there is not this marked sensitiveness, the patient holds the muscles of the face rigid, as any motion of the facial muscles causes pain. By far the larger number occur in the *first branch*, the *supraorbital* being the nerve most frequently the seat of pain. The pressure point is at the supraorbital foramen. The pain is above the

eye, and extends along the nerve to the hair and coronary suture. Malaria seems to select this nerve as its chief victim. It is, however, produced more frequently from other causes. When the entire first trunk and its branches are affected, the pain will include the eyes, the eyelids and the nose, and there will usually be more than one pressure point. *Neuralgia of the second branch* most frequently occurs in the infraorbital nerve. The alveolar or superior dental nerve may be affected alone or conjointly or the entire branch and its distribution may be the seat of pain. The pain, if the entire nerve is affected, will be in the brow, nose, upper lip, malar bone and temporal region. If only the superior dental branch is affected the suffering will be confined to the upper jaw and the antrum.

The pressure points, if in the infraorbital, will be at the foramen, or if of the entire trunk, will be on the gums of the upper teeth, the upper lip, the exit of the malar ramus and the anterior border of the temporal muscles.

In *neuralgia of the third branch*, the pain will be in the lower jaw, the tongue, the chin, the ear and the temporal region. The pressure points will be at the places of entrance of this nerve in the inferior maxillary and at the mental foramen.

Diagnosis.— This is usually not difficult so far as the differentiation from other diseases is concerned. The evidences of other existing diseases are sufficient guides in most cases. If aneurysm of the carotid and sclerosed spots or tumors in the immediate vicinity of the trigeminal exist, or of the Gasserian ganglia, the diagnosis may at first be masked by the neuralgia, but these conditions will soon present characteristic symptoms that will clear up any doubts.

There are many cases, however, that are proved in time to be cerebral, in which it is absolutely impossible to make a differentiation.

The chief difficulty in making a diagnosis is to determine the cause of the pain. It is not enough to call it neuralgia and let it go at that. The gravity of the disease taken in connection with the fact that so many cases can be promptly relieved by the removal of a source of irritation, makes it imperative that the diagnosis shall include the cause.

There are, however, many cases in which we are unable to determine the cause.

Prognosis.— The disease may be acute and run a very short course, or it may be chronic and last for many years. There may be serious inflammation resulting. There are at times quite serious mental complications as a direct result. Marasmus or anemia may be caused by

this form of neuralgia. When the cause can be determined and the irritation corrected, the prognosis is good. It must, to a considerable extent however, depend on the possibility of removing the cause.

Treatment.—This should begin with the most thorough examination by competent persons, of the teeth and jaws; the eyes, nose, pharynx and ears should also be carefully examined. If there is no sufficient trouble found in these parts, the examiner must proceed to cover every possible source of direct or reflex irritation. Any possible source of irritation should be immediately removed or corrected if possible. This must always include the digestive tract in toto.

Electricity is a most valuable agent in the treatment of this neuralgia. Any form of this remedy may be serviceable. In general, apply as suggested under neuralgia. In addition it may be well to use galvanism over the region of the Gasserian ganglion. Central galvanism is also of use in some cases, as is application to the cervical sympathetic.

Nerve vibration has helped a great many very intractable cases. The hammer should be applied over the pressure spots. This will at first cause a sharp increase in the pain, which will be followed by gradual amelioration. In my own experience I have obtained the best results by stopping immediately after the first sense of relief was noticed. All the precautions for the administration of this treatment referred to under ataxia, must be observed.

Topical applications of all kinds have been used, with, however, very indifferent results.

In the way of hypnotics, narcotics, analgesics, and anodynes by the mouth, hypodermatically or locally, there is nothing to add to the suggestions under the treatment of neuralgia.

In trigeminal neuralgia there is a great field for the surgeon. The results obtained from surgical interference have been such as to warrant very careful consideration as to its possible efficacy in every case. When all other means have failed, surgery should always be tried. Neurectomy and extraction of the nerve, have both been succeeded by cure; the former, however, is more frequently followed by remission for a longer or shorter period only. There are possible conditions about or in the foramina that must be looked for and removed if present. In any of these operations on the face the greatest aseptic precautions must be observed. Erysipelas or a herpes quite frequently follow these operations.

There are some cases in which one after another of the teeth are removed, each one being followed by a period of remission. It is very common for the cases, before reaching the neurologist, to have had more or less teeth, often perfectly sound ones, removed. Even after

resection of the jaw, the pain may continue. In the cases of this kind, the seat of disease is certainly within the cranium. The resection of the nerve within the cranium has been followed by permanent relief in some cases. The resection of the Gasserian ganglion was at one time thought to be certain to give relief; while it has many cures standing to its credit, on the whole it has been disappointing.

Aconite (30.), when there is pain on one side of the face, creeping as from an ulcer, heat, thirst, restlessness and anguish. *Argentum nit.* (3x or 30.) pain aggravated about midnight, and as if hot needles were piercing the flesh, that is, very severe burning pains. The patient will be very restless, and will look haggard and careworn. The face will be pale; especially indicated, if there is a tendency to be periodical, *Baryta carb.* (3x trit.).—In anemic cases this remedy has one very distinctive symptom that is occasionally present, a sensation as if the skin were covered with a cobweb; it is almost certain to cure the case if this symptom is present. *Belladonna* (30.). *Bismuth* (6x trit.), when there seems to be relief from constant motion and keeping cold water in the mouth. *Cactus* (1x) is a periodic remedy. The pain is aggravated by stimulants, and ameliorated by lying perfectly still. *Cauticum* (30.), *chamomilla* (30. to 200.).—I have never been able to obtain any results from this remedy in the lower potencies in neuralgias. *China*.—This remedy, according to indications, may be used in its various forms, and with careful study, has proved to be most valuable in this form of neuralgia.

Cimicifuga (Tincture, or the 30.), where it is reflex from the genital organs, and there is great restlessness, with a desire to be in the open air, a tendency to loquacious melancholia. The pain is worse in the day, better at night. *Cina* or *santonine* (30x trit.) is a remedy rarely thought of, but which should be looked up with care. *Colchicum* (tincture or 3x). *Conium mac.* tincture in from three- to six-drop doses, or the 30. is a remedy very frequently indicated. The *ferrums* (3x to 6x) are always to be studied. *Gelsemium* tincture in three- to five-drop doses every hour or two, will be valuable in many acute cases, especially when there is either a local or general chilly sensation with or preceding the pain; the 30. in the more chronic cases. It shows a marked tendency to affect only one branch at a time. *Hepar sulph.* (4x trit.), *Ignatia* (30.), the *Kali's* (3x to 6x trit.), *Kalmia* (tincture) from five to ten drops every hour or two. This remedy has cured some of the most severe, long-standing cases. The pains are fearful, stupefying, or may cause slight delirium. The pain runs from the back of the neck up over the head to the frontal and supraorbital region often in conjunction with the trigeminal pain. The *natrums* in the 30.

Nux vom. (3x or 30.). The various forms of *Phosphorus* (3x trit.) *Plantago major* (tincture) in from five- to ten-drop doses, every half hour in acute cases when there seems to be a combination of toothache and earache. *Platinum* (30.) *Rhus tox.* (3x to 30x), *Sanguinaria nit.* (4x trit.), are especially adapted to many of the cases in which nasal trouble is a prominent factor. *Spigelia* (6x) is probably the remedy most frequently thought of, in our materia medica, for these neuralgias, especially those affecting the first branch. *Stramonium* (3x), *Sulphur* (30x trit.), *Thuja* (30.) *Veratrum album* (3x), *Veratrum viride* (3x), (made from Norwood tincture). The *Zincs* (3x trit.) are the remedies most likely to be indicated. I have no hesitation in saying, as a result of a long, close observation, that the physician who will closely affiliate his remedy to the patient and the case, will have more than thirty per cent of cures to his credit than the one who depends on empirical methods or adjuvant and surgical procedures. Not for a moment would I be understood as advising against these methods, for in the cases in which they are indicated, no affiliation of another remedy will cure, but in by far the larger number of these cases, none but the closely affiliated remedy according to the homœopathic law is indicated.

OCCIPITAL NEURALGIA.

This form of neuralgia is not at all common, but occurs often enough to deserve special notice. It may be caused as all neuralgias by reflex irritation of any kind. The rectum, sigmoid, the colons, the bladder, the urethra and genital organs are all prominent in its causation. Cold, traumatism, or the carrying of heavy burdens on the head or shoulders may produce it.

The pain will be in the back of the neck and run up over the occiput to the vertex. The slightest movement of the head will increase the pain. The head in consequence will be held backward, slightly inclined to one side, and quite rigidly.

The pressure point is usually at the exit of the major occipital nerve. It is nearly always bilateral.

The *diagnosis* presents no difficulties if the symptoms and conditions essential to other diseases in this region are considered. Hysteria will certainly have much that does not belong to this nerve.

The *prognosis* in this form of neuralgia is very good, although occasionally a very stubborn case will be met.

Treatment.—As a rule nothing need be attempted except the affiliation of a remedy. Fully eighty per cent of the cases will recover reasonably quick with no other treatment. The remedies already

suggested under neuralgia and trigeminal neuralgia are the principal ones likely to be called for.

The heat treatment either in the form of medicated water or vapor or dry air has often been of decided benefit.

Galvanism is here very frequently indicated. It should be applied as directed for neuralgia. In recent years the static electricity has helped many of these cases.

NEURALGIA BRACHIALIS.

The musculo-spiral and the ulnar nerves are the most frequent seats of pain in this neuralgia. In a good many cases the entire region supplied by the four lower cervical, and the first dorsal nerves will be the seat of the pain. The pain is exaggerated by motion, and consequently the patient is inclined to keep the arm quiet, either by supporting it with the other hand or in a sling. The pressure points will be found along the course of the nerves, possibly most frequently along the musculo-spiral. The neuropathic temperament is always present. Traumatism may cause it. The various sources of reflex irritation may be the immediate cause. It is quite frequent in neurasthenia and hysteria. There is no doubt that a true neuralgia of the arm is often due to heart trouble. Aneurysm of the subclavian may also produce it.

Diagnosis.—In hypertrophic pachymeningitis of the cervical region, caries of the vertebræ, and meningeal tumors in this region, the pain may be for some time the only symptom. They may reasonably be diagnosticated as brachial neuralgia, but soon the collateral evidences of cord lesion will appear and identify the real seat of the lesion. Then in these cases both arms are usually affected, except possibly in tumors while this neuralgia is usually unilateral. This is a rare form. Nearly all the cases presented prove to be hysterias.

Treatment.—This does not need any special suggestions aside from those made for neuralgia, except to call attention to galvanopuncture.

INTERCOSTAL NEURALGIA.

Neuralgia of the intercostal nerves usually affects several at the same time. It is most frequently on the left side. It is most frequent in young women, but does affect men as well. There are a good many cases occurring in old age. The neuropathic temperament here again is an important factor. Any of the sources of irritation may cause it. It may be the result of traumatism, or it may appear when, from any reason, there is a low state of nutrition. The pain is very nearly

continuous as a rule, but, like all neuralgias, there will be distinct sharp exacerbations. The simple fact of there being pain along the course of one or more intercostal nerves, without the collateral evidence of any organic disease will make the diagnosis clear.

The pressure points are quite characteristic. There will be one close to the spinal column over the affected nerve, one at the axillary line, at the ramus perforans lateralis, and one anterior where the rami perforans anteriores appears.

Treatment. — All the possible sources of reflex or direct irritation having been carefully looked after and corrected, the next step is to secure as far as possible, immobility of the chest walls. This can be accomplished by the shingling with adhesive straps. The heat treatment in any form may be a very valuable adjunct in these cases. It should be applied thoroughly and persistently.

The physician should never lose sight of the fact that a crooked spinal column, a fractured rib, a tumor on a rib, or other abnormal conditions, may be present, and if so, must be corrected by the proper methods. A very severe case that refuses to abate under ordinary treatment, should be operated upon. The nerve may be stretched, or a portion of it excised to advantage. The treatment as suggested under neuralgia modified to fit this particular location is all that need be suggested in addition to the above.

NEURALGIA LUMBALIS.

This neuralgia usually implicates the lumbar region, and the pains run out to the lower abdominal region, the inguinal crease, the scrotum, and into the spermatic cord. It does not always attack all these regions. The pains may be confined to one or more of them.

In another form of lumbar neuralgia the anterolateral femoral cutaneous, the crural, and the obturator, one or all, is the seat of pain.

The pressure spots are by the side of the lumbar vertebræ, above the crest of the ilium, and along the ilium, or on the scrotum.

In making a *diagnosis* in these cases the most careful and minute examination of all the neighboring parts must be made. The diagnosis as, in fact, in nearly all neuralgias, must be made by exclusion. The rectum, sigmoid and the colons must be free from any possible producing cause. The genital organs and the urinary organs must be carefully scrutinized. The entire abdominal cavity palpated and percussed for evidence of unnatural dullness. In short, there must be a complete ruling out of all other causes for irritation to these nerves.

It is probable that neuralgia of the crural is the most frequent of the lumbar neuralgias. In it the pain is in the course and distribution of

this nerve down as far as the knee. Sexual overindulgence, natural or unnatural, may be said to have a rather prominent place in the causation of lumbar neuralgias. The usual causes of neuralgias are here as elsewhere.

The *prognosis* of this neuralgia is quite favorable as a rule.

Treatment. — Hot fomentations, medicated or not, are frequently of service. The superheated dry air has also shown many good results. The faradic, galvanic and static forms of electricity are all helpful as well as curative. Dry cupping over the lumbar region is a valuable adjunct and sometimes is sufficient. For other methods and remedies I refer to the general treatment of neuralgia.

SCIATIC NEURALGIA.

Synonyms. — *Malum Contunnii*, Ischiatic Neuralgia, *Sciatica*.

This is one of the most common forms of neuralgia. Women are less often affected than men, mainly because less frequently exposed to its causes. It is most common in middle life, but older persons are not free from it. A very large proportion of the cases diagnosticated as sciatic neuralgia, are not true neuralgias; a differentiation from neuritis in the sciatic is often impossible. Fortunately, it is not absolutely essential in directing the treatment. We recognize an acute and a chronic form. In the acute, the pain is very severe, causing helplessness, and is accompanied by more or less febrile disturbance. It often runs its course in about six weeks, and terminates frequently in complete recovery, but sometimes in a chronic condition. It will at once appear patent that this is not a pure neuralgia, but it seems best to consider it in this connection.

Etiology. — The neuropathic temperament is an important factor in this, as in all neuralgias. General debility, low nutrition, and anemic conditions are, however, not to be considered as predisposing causes of this disease. Syphilis, except from gummata, is not to be classed among the causes. Diabetes occasionally causes a bilateral sciatica, and rarely a unilateral. It may be the result of alcohol or lead poison, and quite frequently is of mercurial origin. It not infrequently is preceded by gonorrhea. Sciatica may occur in the course of or follow any of the infectious diseases. Muscular rheumatism and gout are frequent sources of this disease. Overexertion of the legs, sitting for long periods on a hard substance, or so that the edge of the seat produces undue pressure, may produce it. Exposure to cold and damp, especially sitting on something cold, will very often cause sciatica. Traumatism of any kind may be the cause. The etiological factors

active in producing other neuralgias or a neuritis, reflex irritations and and spinal lesions may be equally active in this disease. Anything that can possibly irritate or press upon the lumbar cord, the lumbar nerve roots or the sciatic at any point along its course, may be considered an etiological element in sciatica.

Symptoms.—In the acute cases, to which I have referred, the onset is quite frequently rather sudden, although, sometimes, there will be a preceding uncomfortable feeling, and more or less dull pain in the sciatic region. The pain will be clearly in the course of the sciatic, and may extend to the foot, and it may be very severe. It is often practically continuous, with very decided paroxysms of great intensity. Every motion will increase the pain. Frequently emotional disturbance will cause aggravation. There is usually more or less febrile disturbance. This, in some cases, may be a prominent feature, while in others it will attract very little attention. The symptoms will all vary much in intensity from day to day. One day everybody is sure of great improvement, the next as sure the opposite is the case. So far as I am able to learn, either from my own or others' experience, the attack will last about six weeks, in spite of any treatment. It will then usually subside rather rapidly, and the patient is well, with the exception of such convalescent conditions as would naturally result from the fever or the long suffering and confinement. Very frequently it leaves no indications of any kind behind, but there may be left a chronic sciatica, or possibly muscular contraction of some kind in a very few cases. The collateral vasomotor, sensory, and trophic disorders, muscular symptoms and other phenomena, that often accompany this disease, need not be mentioned, as they are not characteristic. They are very variable.

The *diagnosis* is made from the one fact that the pain is confined to the sciatic and its distribution, together with the exclusion of any other possible lesion. It is not difficult to make the differentiation.

Treatment.—I will suggest the treatment for this particular form of sciatica before giving the symptoms of the ordinary usual forms. All possible sources of irritation must first be removed or corrected. This must include abdominal and pelvic troubles, of any kind, that may be present. The next special point in the treatment must be absolute rest, with as near absolute immobility of the affected leg as can be obtained. I do not believe that the various anodyne liniments are of any service whatever, nor do I believe it wise to try hot fomentations and the like. These things cannot be used, and at the same time the leg be kept quiet, as it should be. I believe I have had quicker, and more decided relief from the thorough

use of antiphlogistine than from any other external application. In many cases the hypodermatic injection of Squibb's aqueous solution of Ergot, from ten to fifteen drops every three or four hours, for two or three days, seems not only to give temporary relief, but does permanent good. Injection of sterilized water, or of the normal salt solution, will frequently give prompt relief, and for a considerable time. Massage is not indicated. Galvanism is the only form of electricity that should be employed, and it should be used in every case. The method of application is that suggested under neuritis. If, as is sometimes the case, the urine is very acid, it must be made slightly alkaline. This can be accomplished by the administration of carbonate of potash in solution; have the patient take from one to two grains every two hours, constantly testing the urine with litmus paper until it is found slightly alkaline. The sodium salicylate treatment may be efficacious very early in the case, but will not be of much service later. When used the dose should be from five to ten grains every two hours. Hypnotics and narcotics should not be used unless absolutely necessary. When anything of this kind is necessary, the best plan is to use Morphia sulph., in the sciatic region hypodermatically. It is better, as a rule, to use the small dose, and repeat; then to use larger doses, one eighth of a grain given every hour until relief is obtained; this will give much better results than a half grain at one dose.

The indications for remedies are the same as for neuritis or neuralgia.

In the ordinary form of sciatica the onset is quite gradual. There will be at first a dull, uncomfortable feeling in the gluteal region or back of the thigh, with possibly a feeling as though the leg were tired. This sensation increases to an actual pain in the course of a few weeks. In the early stage it will be a drawing pain, and in many cases of long standing it never is anything more than a drawing, grinding pain. Usually it becomes a boring, piercing, stabbing, excruciating pain, going down the legs. There is very often a continuous pain with decided sharp paroxysms of greater or less severity. The pain will be confined to the course of the sciatic nerve and its distribution. It is quite common for the patient to point out the exact course of the nerve with his finger, from its emergence through the sciatic foramen in the gluteal region, along about midway between the trochanter and the tuber ischii, down the median line of the posterior part of the thigh, in the popliteal space and to the malleoli. The region of the saphenous major is the only parts of the leg that may not be attacked. The rule is, however, that only one nerve is involved. The pain is nearly always

aggravated by sitting on a hard seat, by pressure of any kind, by walking or motion of any kind. The patient may start to walk feeling very comfortable, but will find in a very short time that the pain is getting more and more severe. The patient in sitting or standing will protect the affected leg by supporting himself as much as possible on the sound side. It hurts to flex the thigh, or keep the leg straight. The patient, as a rule, walks or stands with the knee and hip both slightly flexed. Occasionally tremor and sensory disturbance will appear in that entire half of the body.

The pressure points are at the side of the posterior iliac spine, at the exit from the major foramen, at the lower border of the gluteus maximus, between the trochanter and the tuber ischii, in the middle of the popliteal space and possibly at the malleoli. In true sciatica there will not be tenderness along the entire course of the nerve, but only at these pressure points.

Diagnosis.—To make the diagnosis, note the seat and the distribution of the pain, and the pressure points. Then have the patient lie down on his back, raise the leg, keeping the knee straight; if sciatica is present, there will nearly always be pain when the foot has been raised about twelve inches, and it will increase as the foot is raised higher, on account of the stretching of the sciatic nerve, but it will at once disappear if the knee is bent. If it is a case of sciatica, there will not be anesthesia, paralysis or degenerative signs. There may be a simulation of incomplete paralysis produced by the dread of the patient, of pain from motion. A very little observation will determine that this is the cause of the apparent loss of motion. In spinal lesions the pain is never limited to the sciatic nerve. In muscular rheumatism the pressure spots will not be present and the pain will be diffuse, not limited to a nerve or nerves. There will be pain in the muscles if they are squeezed, or from pressure at their insertions. In hip-joint disease the pain at the hip is in the joint, at the knee it may be very like sciatica, but the pressure spots are not present. The rectum and the pelvic cavity and abdominal cavities must be very carefully examined, as many cases cannot be differentiated except by finding that there is sufficient cause in these parts to produce the pain. It must be remembered that the line between a neuritis and a sciatica cannot always be drawn. If there be a severe neuritis sufficient to produce marked motor, sensory and trophic disturbances, the differentiation offers no obstacles.

Prognosis.—The chances for recovery decrease as the patient grows older. There is a marked tendency to recurrence even years

after an attack. The rheumatic, exposure and traumatic cases offer the most favorable outlook. The possibility of removing the cause must necessarily modify the prognosis.

Treatment. — The leg should be put at rest as near as may be. These patients cannot often be confined to the house or the bed. The adhesive straps will help to secure immobility. There should be a minimum of exercise. The patient should be instructed to always try to find the easiest position for the leg. The objects on which he sits must not be hard. Air cushions are a great comfort to these patients. Every possible source of irritation should be found and corrected or removed. I repeat this injunction so frequently because of its great importance. Heat treatment in any of its forms is advisable. The various hot and magnetic springs have a long list of cures of very intractable cases. The mud baths of Indiana have been very successful in this line of cases. A complete quantitative analysis of the twenty-four hours' urine should be made in every case and the essential steps taken to make this excretion normal in every respect.

Massage administered with great care may be of great value. It should always be considered.

Ethyl chloride or chloride of methyl spray may be useful. Sterilized water may be injected into the nerve sheath. This treatment in many cases will give very prompt and even lasting results. The hypodermatic injection of Squibb's aqueous extract of Ergot is well worth a trial. About ten drops once or twice a day should be given. Here again good results have been obtained from the use of antiphlogistine.

Stretching of the nerve has been very successful in many cases, but has not done all that was expected of it. The stretching of the sciatic by bending the leg as suggested under diagnosis, except that the leg is brought up as nearly on to the chest as possible with the knee kept straight, and held in this position several minutes at a time is reported to have given favorable results in several cases.

Electricity is a remedy of great value. The galvanic, faradic and the static have each their strong advocates, made so by the results that have been obtained. I have used all these forms and know of no better rule for the selection than to try one and then another, and observe from which the greatest immediate relief is obtained, then use that form for the curative effect as well as for immediate relief. The suggestions made for the use of this remedy under the general treatment of neuralgia will apply here, with the additional suggestion that in sciatica it has been found that, as a rule, strong currents give the best results.

Arsenicum (3x) and *Rhus tox.* (3x) are very closely allied in their

effect on this form of neuralgia. A careful differentiation should be made when either seems indicated. They are both called for very frequently. *Belladonna* (3x to 30.) is a remedy that is used possibly more than any other, but probably disappoints in nearly every true neuralgia, but in the cases in which there is a slight neuritis and attendant hyperemia it gives brilliant results.

Colocynth (3x) and *Cocculus* (3x) both have the drawing, crampy pains, and should be looked up in every case. *Gnaphalium* (30.) is likely to be indicated when the trunk and all or nearly all of its branches are affected. *Phytolacca* (tincture) of the berries in from five- to ten-drop doses every three hours, has done good in many cases. It is possibly, as is *Stilingia*, better adapted to cases in which syphilis preceded the sciatica.

The *Iodide of Potassium* treatment so often recommended, has not in my hands been at all what I have hoped it might be. I have failed except in a very few cases to get any results. *Terebinthina* (tincture) in from two- to five-drop doses has been curative in a good many cases. *Viscum album* (tincture) has the credit of curing a number of severe and long-standing cases. It should be given in from five- to ten-drop doses every two hours. *Cimicifuga*, *Gelsemium*, the *calcareas*, *Chinin sulph.*, *Caffeine*, *Kali bichrom.*, and *Plumbum* are a few of the many remedies I have derived benefit from in these cases. I have yet to mention two remedies that should always be carefully studied. They have been indicated more frequently in my cases than any others, and have rarely disappointed me when I used proper care in their selection. They are *Lachesis* (30.) and *Lycopodium* (30x trit.).

PUDENDO-HEMORRHOIDAL NEURALGIA.

Neuralgia of this nerve occurs very infrequently indeed, but is very persistent when it does occur.

The **etiology** is very indefinite. It is probable that this is produced by the same causes as neuralgia in other parts. The pain is most frequently in the testicles. It passes through the inguinal region along the spermatic cord to the scrotum and epididymis. There will be hyperesthesia of the skin, and possibly some swelling of the affected parts; erections and even emissions occur at times.

It must be differentiated from tubercular deposits and from the lancinating pains of ataxia. This presents no difficulty.

Treatment.—The first thing is the discovery and removal of all possible sources of irritation. Electricity either the galvanic or the faradic current will probably do more for this neuralgia than any other

remedy. It is to be used according to the general suggestion, for its use in neuralgia. Castration has been advised in very stubborn cases, but so far as I can learn, with indifferent success.

COC CYGODYNIA.

It is very uncommon to find this form in men, but they are not absolutely immune.

It is nearly always the result of traumatism, or of disease in the rectum, bladder or genital organs. It most frequently follows falling in such a way as to strike the coccyx, or from injury during labor.

This form of neuralgia cannot be said to occur very frequently, neither can it be considered as rare.

The pain will be most severe or occur only when sitting so as to cause pressure on the coccyx, during or immediately after a movement of the bowels, urination, coitus, or when walking. In the cases in which there is a steady continuous grinding pain some disease, as caries or fracture of the coccyx, will nearly always be found. It is quite frequently found in hysteria.

The diagnosis aside from locating the source of the pain will offer no obstacles.

Treatment.—In every case an intrarectal and vaginal examination must be made, and every possible cause for pain removed or corrected. Various kinds of suppositories are often very valuable means of cure. The kind of suppository must depend on the conditions found. Where it seems to be a pure neuralgia, opium and cocaine suppositories may be of use if the case is a recent one. Douches and enemas of very hot water may give relief, and if given frequently and regularly may be curative.

Electricity is the main remedy. I have had better results from the faradic current than any other form of this remedy in these cases. I sometimes use one electrode in the vagina and the other in the rectum, or one pole in either the vagina or rectum and the opposite pole directly over the coccyx. I find no better or more convenient electrode for intrarectal treatment than a Pratt's metal rectal plug, to which I attach an insulated conducting wire.

A pretty strong current should be used. The treatments should be daily and about fifteen to twenty minutes each.

The galvanic may be used; when it is, the positive pole should be placed over the coccyx, and the negative over various points along the course of the nerve and branches. I cannot advise the intrarectal use of galvanism.

IV. THE NEUROSES.

HYSTERIA.

This is a disease — just as much a disease as any with which the physician has to deal. I want to make this statement emphatic, for the sake not only of the physician, but the patient as well. While we must as yet class this disease as psychic, it must not be considered as a purely imaginative condition in the ordinary meaning of this term. The various symptoms are to the patient realities, and cause just as keen suffering as any organic lesion. Neurologists to-day believe that there is a nerve structural change of some character actually present in hysteria. The most commonly accepted theory is that of molecular change in the nerve elements of the brain.

That there are cases, and many of them, that are nothing but attacks of temper, or are deliberately planned for a purpose, no one will dispute. These cases cannot properly be considered as hysteria.

While it is true that women are much more often affected with this disease than men, it is also true that it does occur in men quite frequently. No one is exempt. Persons are much less subject to it after fifty or sixty years of age.

Etiology.—The neuropathic temperament must first be mentioned. This of course includes heredity. The hereditary influence is as frequently indirect as it is direct; that is, there are other conditions in the parents acting as predisposing causes as frequently as hysteria. Conditions just previous to conception or of the mother during gestation may predispose. Dissipation of any kind in the parents may do the same. Severe grief or emotional disturbances in the parents or the mother may also be considered as hereditary influences.

The direct causes are legion; it would be folly to undertake to enumerate them. Any emotional shock or a severe physical shock may be a direct cause. It is, however, the very frequently repeated emotional shocks continued over a long period of time, that most frequently cause it. Dissipation must be considered among the etiological factors. Deficient nutrition and malnutrition must be considered as a direct source of this trouble. Incomplete excretion or elimination of the waste body products are frequent causes. Hysteria may follow any of the debilitating or wasting diseases. Sexual irregularities and excesses are common causes. Toxemia and infection may produce it. By far the greatest number of cases, however, are, I believe, the direct result of some reflex irritation in a predisposed person; that is, one with either a congenital or acquired predisposition to hysteria. There are certain prominent

characteristics that must be present. An irritability unnatural to the patient combined with a changing disposition. The patients are more markedly affected by varying emotions than has been the rule of life in them. Mental or physical suffering is out of proportion to the causes for them. Their influence on the various tissues and organs of the body, on the secretions, excretions, the vasomotor and sensory functions is more pronounced than is normal. The imagination is increased to such an extent as to cause the patient frequently to live over as reality past events. Actual hallucinations may result from the imagination. The idea of a paralysis may result in actual paralysis. The same may be true of nearly any symptom. The conceptions, though, change frequently. The various hysteric phenomena are apt to appear suddenly and disappear just as suddenly, only, however, as a rule, to be replaced by some other, or to reappear after a longer or shorter remission.

There is one characteristic that I must emphasize, that is the constant great desire, yes, demand, for sympathy, from those around, or with whom they come in contact. This demand may not be made in words, but is plainly evident at all times. It seems, often, in fact to be the keynote, the very foundation of hysteria.

Symptoms. — This disease may simulate more or less closely any known disease. There is no subjective symptom that a patient with hysteria has not had or may not have. It naturally nearly always is some chronic disease that it most closely resembles. It is also most likely to be some form of disease with rather striking symptoms either subjective or objective, and is quite likely to be one of the more serious diseases. The symptoms are likely to be at the same time very persistent and very changeable. The patient will have a certain train of symptoms which will be prominent and persist for a long time without change, then gradually or suddenly an entirely new combination of symptoms will appear. The patient will unduly emphasize one for a time, and then will put the emphasis on another. There is one very characteristic element that must be carefully studied. This will often be the only guide to a correct diagnosis. The combination of symptoms will practically always have certain elements that cannot possibly occur in any pathological condition. The picture of the disease simulated is not complete, it is lacking in some essential feature, and will have certain other features that cannot possibly be accounted for in that disease. The combination is likely to be made up of a part of those belonging to each of two or three organic lesions; they are likely to be contradictory to each other. Careful analysis will show an unreasonable combination of symptoms.

The patient is usually irritable and emotional. Very emphatic in

statements regarding the condition, and quite apt to desire to impress friends, family and physician with the severity and importance of the case. While this is the usual case, there are many who will not be either irritable or emotional. These patients, however, in a very quiet way use means that tend to impress all about with the gravity of the situation. They all want and will get sympathy in some way. In some cases there is a perversion of this prominent symptom, a desire for sympathy, and instead there is a great desire for notoriety, or for startling effects, sometimes in one way, at other times in another.

There is a very prevalent idea among the laity, and the profession is not entirely free from the same idea, that a patient with hysteria is necessarily and essentially weak, and has little force of will. This is erroneous; the fact is, by far the larger number of persons with this affliction are not only fairly well educated and intelligent, but have strong wills and a large element of persistence. Some of the very brightest and strongest people mentally suffer from hysteria.

It is impossible for the patient to prevent by will force the expression, in some form, of emotions. The emotional feeling is entirely out of proportion to the cause. The expression may be in the way of active demonstrations, or in a very quiet, calm manner, yet impressive.

There may be tricks of memory. This faculty may be unusually well preserved, or it may fail to almost any degree. Memory, however, in the most hearty and healthy is quite likely to play queer pranks. The nearly constant undivided direction of the attention in any one direction will destroy the memory in any person.

A sensation of fear evidenced in a feeling of pressure or goneness in the abdominal region, or heart palpitation, or both, is a common symptom. There occurs in many cases a dreamlike condition in which the patient, by the appearance of the face, general manner and actions show themselves to be delirious. These attacks usually appear rather suddenly, last a few minutes or hours, and as suddenly disappear. They may be concomitant with spasms or independent. In hysteria there may be present catalepsy, a hysterical sleep, or somnambulism.

Catalepsy.— This may appear as a result of some emotional disturbance or without apparent immediate cause. It may last only a few minutes, or hours and days. The attacks may reoccur at various intervals. The cataleptic condition may affect the entire body or only a small portion of it. The patient usually lies perfectly still with the eyes closed; the respiration and heart action is weak. The reflexes, both superficial and deep, with the exception of those in the eyes, may be absent. Cutaneous sensation is absent, often deep sensation as well. The patient can be pricked with a pin or cut with a knife, even, quite

deeply, without the least manifestation. If an arm or leg is placed in any position, no matter how awkward or uncomfortable, it will remain in that position (maybe without the slightest tremor) until changed by the attendant.

In some cases the limb will remain for an indefinite time as placed, and then very slowly drop to a position of rest. In most cases there is no resistance on the part of the patient to any change of position of the body or any member. In other cases, there will be a rigidity of the muscles that will cause great resistance.

The *hysteric sleep* is a condition not so very infrequent. The patient simply seems to be in sleep; there will nearly always be slight twitching of the lids. The reflexes will all be present. Respiration and heart action may be weak or slow. In some cases no heart action can be determined for some minutes, in which case the simulation of death is quite marked. In some cases the muscles will be relaxed, in others quite rigid, or there may be various muscular contractures. Nearly always there will be some movements that seem to be volitional.

Somnambulism.—Attacks of this may occur and last for indefinite periods. The patient may be very acute in many ways; may be able to perform feats that would be utterly impossible in waking hours. The entire nature will be changed during the attack. The patient may get up during sleep and walk about and do very difficult feats. When awake she remembers nothing that has occurred at this time, but will remember during a succeeding attack.

Sensory Symptoms.—Pain is practically always prominent at times. It may be of any character or intensity. Very frequently with the headache there will be a sensitive scalp. The sensation as if a nail were driven into the skull, or an intense pain confined to a circumscribed area is quite characteristic. Headache confined to any one section or region of the brain is common. The painful symptoms follow the same general course as all others. Paresthesias are very common symptoms. They may be of any kind. Formication, numbness, anesthesia and hyperesthesia are the most common, probably because best known by the patient. These symptoms, however, will not be distributed according to the distribution of known sensory areas. They will include less area than must be for an organic lesion, or will cover a greater territory, or may include simply a part of the territory of each of two or three sensory nerves, contiguous in their distribution on the surface.

The hyperesthesia is quite likely to be distributed or to be identical with certain sensitive zones. There are regions in which spontaneous

pain frequently occurs, or on which pressure will always cause marked symptoms. Frequently during a convulsion or some other severe form of attack, pressure on these points will at once arrest it. The most prominent zone is the ovarian region. The region of the apex beat of the heart is also a common zone. Next will be the stomachic, under each breast, the upper end of the sternum, and beneath the outer end of the clavical.

There is also quite frequently hyperesthesia of all the special senses.

When anesthesia is present it is quite characteristic as a rule. In very rare cases it may be of the entire body, but more frequently takes in one lateral half of the body, the median line front and back marking its exact limit. Then again it is quite common to have the hand and arm affected up to some point, the entire surface of the hand and arm anesthetic up to this point; the line of demarcation could be marked by tying a string around the arm. The foot and leg may be affected in the same way, that is, the anesthesia is not according to nerve supply. It will also include deep loss of sensation as well as on the surface. The reflexes are very uncertain factors in hysteria. The tests for the reflexes are only of value when they are produced with the patient's mind diverted, or when obviously the reaction is volitional, or the prevention is volitional.

Motor disturbances are very common, they may be of any character but will have the general characteristic of hysteria. General or local tremor, general or local spasm, and general or local paralysis may be present.

The general spasm or convulsion has frequently been termed "Hystero Epilepsy." There are some of the very best authorities who discard this term entirely. There is however a form of general convulsion, occurring in hysteria quite frequently that is better described by this term than by any other. The patient with or without warning or an aura, is attacked with general convulsion very closely resembling epilepsy. Very careful study will develop the fact that the patient does not actually lose consciousness. Close observation will also show the spasmodic movements to be of a very pronounced nature, and such as it is possible to make from volition. There are several types of these spasmodic seizures, but it is not necessary to enumerate them. Muscular contracture and consequent deformities are quite frequently found. If the patient is anesthetized the contracture and deformities disappear at once, and often to return with the return of consciousness. Nearly always a decided tendency in the rigidity to increase will be noticed, whenever the patient's physician is about to, or does undertake

to manipulate in any way the deformed member. Hypnosis will also cause these contractures and deformities to disappear. Aphonia or difficulty in swallowing are quite common symptoms. Disorders of digestion, of secretion and of excretion, are nearly always present. Vasomotor disturbance of some character is a constant accompaniment. There may be some sexual disturbance.

Diagnosis. — The differentiation must be made by exclusion. The exclusion must be based on the results of a careful physical examination. A complete physical examination of every organ and tissue in the body is important not only for the purpose of determining the existence of an organic disease of the nerve structures, but also in order to complete the diagnosis of the hysteria. The diagnosis must include the cause. A diagnosis simply of hysteria can never be a complete diagnosis.

In every case of hysteria careful watching will show that psychic influences always affect all the symptoms present to a greater or less degree which is not the case in any organic disease.

There are patients who must be considered as naturally hysterical. With them this disease is congenital, or it may be claimed that they have a natural hysterical disposition. In this class of cases the prognosis as to cure is not favorable. Much can be done to mitigate this disposition provided the physician can get the opportunity and will give the patient the necessary attention. A very large proportion of the hysterics are the result of some reflex irritation; these cases can be cured. The cases resulting from malnutrition can also be cured.

Treatment. — The one thing absolutely essential in hysteria is self-control. If every child including those with a hysterical disposition could from early infancy be taught self-control, this disease would be almost stricken from our records, instead of demanding a very large share of our time and study. The preventive treatment where prevention is possible is always the grandest function of the true physician. The preventive treatment of this disease lies in the management of the child. It must first of all be taught obedience, not simple abject obedience, but reasoning obedience. I do not believe in breaking the child's will, but in strengthening it. When the child does that which is contrary to its desire because of love for a parent, or because it is right, it is using and developing self-control. Another element in the same line, and yet sufficiently important to deserve special attention, is the teaching of the child to be systematic. This is done by commencing with it as a babe, and teaching it, by example, to be regular in all things. Teach the habit of regularity and system.

A case of hysteria having developed, the very first thing is to

correct any source of reflex irritation. Correct the secretions and the excretions. Get perfect digestion and assimilation. See to it that the patient is thoroughly well nourished. Close and constant attention must be given to this. A quantitative analysis of the twenty-four hours' urine must be made. This will reveal a cause for hysteria I have not mentioned. A good many cases will be found to be suffering from chronic uremic poisoning. In other cases oxaluria will be present. In many cases in which Oxalate of Lime is found, a very careful examination by palpation and percussion of the abdomen, will reveal a loaded colon, in other cases simply intestinal digestive trouble. It may be necessary, also, to analyze the stomach contents after a test breakfast. Frequently an analysis of the blood will be found not only essential to the correct diagnosis, but important on account of the impression it makes on the patient, as an element in the treatment. The next step to be taken is to secure the patient's confidence. You should at all times, and under all circumstances, be absolutely truthful with the patient. This class of cases demand of the physician positive frankness. I always feel great confidence in the recovery of any hysteric, as soon as they show clear evidence of being amenable to discipline. The discipline must be kind, but firm and steady. There must be no hardness, nor must there be any wavering. If you cannot control the patient you cannot cure her or him.

Be careful not to give too voluminous directions, but insist on all you do, being carried out fully. Demonstrative treatment usually produces the best results. *Massage* is indicated in a very large number of cases. As a rule it should be given daily. Regular systematic *physical exercise* with breathing, will be very valuable in many cases, at the same time there are many cases in which it is not indicated at all. The *heat treatment*, by any of the various methods, is frequently of the greatest value. Various medicated baths have been used with benefit. The "Weir Mitchell Rest Cure" has many essential curative elements for hysteria in it, and is to be credited with some nearly marvelous cures. The rest treatment will be found described more at length under neurasthenia. The actual cautery, and the vacuum treatment are also useful adjuncts. Electricity in all its methods of administration is very nearly always called for. The static current here has made a decided reputation for itself. It would be impossible to give even a brief outline of the methods of using electricity in hysteria. The general rule of applying with only slight modification, as directed for the disease that the particular case simulates, must be the guide for the galvanic and faradic current. For directions for the use of the static, I will have to refer to some treatise on that subject. One of the

most difficult problems to solve is how to divert the patient's attention from self. This cannot be accomplished by telling the patient to stop thinking of self, or of his or her symptoms. The patient cannot do it. The physician and attendants must attract the attention in some other direction. This must be accomplished by substitution, and it is impossible for the patient to make this substitution of himself or herself. At times the attention can be diverted from one set of bad symptoms, by placing emphasis on some physical condition that may be present; curing this will often cure the case. In many instances, however, it will be found practical to divert the trend of the patient's mind on to subjects entirely outside of self.

Hypnotics to produce sleep are at times required. There are very few cases, however, in which various adjunct methods suggested in this article will fail to produce sleep. Many times, especially when there was special vasomotor disturbance, causing a condition simulating cerebral hyperemia, I have found that placing the negative electrode under the sacrum, and the positive high under the back of the neck, with a current of only one or two milliampères, and allowing the patient to lie quietly on the back under this influence for half an hour or more, a refreshing and long-continued sleep has followed, in very intractable cases. I am inclined to the opinion where a hypnotic is necessary that *trional* is the most useful. It should be given in ten- to fifteen-grain doses, repeating every hour until a long, quiet sleep is produced. *Sulfonal* may be useful; it should be given in fifteen- or twenty-grain doses, in very hot water, two hours before the sleeping time. *Chloralamid*, in from fifteen- to twenty-grain doses, in hot water, is another safe and efficient sleep producer. Either of them may be used until the sleep habit is restored. These remedies, however, need be resorted to but rarely. *Passiflora* (tincture) in from twenty-drop to two-teaspoonful doses, is, in many cases, an elegant sleep producer. The best results are obtained by putting the required amount of *Passiflora* in two thirds of a glass of water, and taking it in three doses, at half-hour intervals. The Fl. extract of hops is another remedy that will frequently produce sleep. It should be given in from ten- to thirty-drop doses. *Coffea cruda* or *Caffeine* (1x to 3x trit.), *Cimicifuga* (tincture) in from three- to five-drop doses every fifteen to thirty minutes, or *Macrotia* (1x trit.), *Gelsemium* in five-drop doses every hour for three consecutive hours. *Scutellaria lat.*, (1x trit.). Any of these may be sufficient. The good old remedy of our fathers for hysteria must never be forgotten. *Asafetida* in from one-tenth-grain to five-grain doses will sometimes produce marvelous results in controlling outbreaks, spasms, or general muscular or nervous tension, or in producing sleep.

In the constitutional, hereditary, or the neuropathic cases, the curative remedy must be selected according to the plan of prescribing for the patient rather than for the disease. In hysteria there is not the slightest doubt that the physician who studies his case the most closely, and affiliates his remedy the most closely, will cure the majority of his cases. He must, however, if he is to get the most prompt as well as the best results, use the higher potencies. A list of the remedies likely to be indicated in hysteria would include nearly the entire *materia medica*. A good many years ago I discarded all idea of special hysteric remedies and since have, I am sure, seen better results from the administration of remedies. The reason is, I believe, that there is always, except in a very few transient cases, a positive dyscrasia as the prime factor. I will take up the treatment of the convulsive attacks with that of epilepsy.

Hypnotism.—In immediate connection with hysteria something should be said on this subject.

Most brilliant results have been produced through its use in the cures of hysteria. This is probably its greatest field, but much has been accomplished through its use in other diseases and conditions as well. I do not like the term "hypnotism." I prefer to call it Suggestive Therapeutics, as a number of the best and most advanced authorities of this day have termed it.

This method of influence is based on the well-known influence of the mind over the body or over any organ of the body. No argument is needed at this time in favor of this mental action. It is thoroughly well established that the mind may change the nutrition of tissue, and by so doing produce either functional or organic disease. It is equally well established that this same effect may cure functional and organic diseases as well. While this statement is true, we must not lose sight of the fact that its possible power is limited to those organic diseases in which there is no destruction of tissue. The limitation practically is as yet much narrower than this. What may, with study and experiment, develop in the future no man can tell. It is possible that the many "isms" of to-day in which the element of the cure is mental suggestion, may assist the true physician to arrive much more quickly at the true limitations and to a quicker understanding of the methods by which the best results are to be obtained. It is not the weak-minded or the uneducated that are most susceptible to this influence as a rule. Neither is it the vacillating mind that influences the tissues of the body most profoundly. Every successful physician from the time of Hippocrates to the present time has used mental suggestion in some form and always will.

Hypnotism is not a sleep, but is very closely allied to somnambulism. It is a condition in which the mind of one person may influence that of another to such an extent as to cause that one to perform certain acts entirely at the volition of the other, and without any volition of his own, or it may be contrary to his own volition. A condition very analogous to this not infrequently occurs spontaneously in hysteria. It is, however, always the result of suggestion from some source whether it be in hysteria and spontaneous, or produced through another's mind and act.

Medically, that is, for the relief or cure of disease, the sleep or hypnotic state may be employed, or, in very many cases, no attempt of this character will be needed. The physician can use pure suggestion without it.

To produce the hypnotic condition the free consent of the patient, and also the concentration of the thoughts are essentials. It is equally necessary for the physician to be confident of himself and calm, and in addition have the confidence of the patient. The patient should know the part he is to have, and that, in reality, he produces this state himself. It is far better to explain fully to him before commencing the effort. The operator may hold any bright object a little in front of the patient, and elevated so that the patient's eyes must roll up somewhat to see it. The patient is then directed to fix his gaze steadily and persistently on the object, and to concentrate all his thought on it. After a few minutes the eye muscles become fatigued slightly, and then passes of any kind, so long as they do not detract the patient's mind, may be made. At the same time it is well to say in a very quiet, calm, confident manner and voice, "Now you are slightly drowsy." This phrase may be repeated several times, then changed to "Now you are going to sleep;" "Your eyes are heavy;" "Now you are asleep;" "You cannot open your eyes." Very frequently just as prompt and complete results may be obtained by simple word suggestion. The entire object is to concentrate, and keep concentrated, the patient's mind on sleep, on the fact that he will go to sleep, and that he is asleep. The patient should be informed before commencing the experiment, that he will, even while asleep, hear all that is said. When he becomes somnambulistic he is told that he will waken at a certain sign. It may be a physical sign, or it may be a peculiar phrase, or simply some one word, possibly the most frequent is, "Now you are awake." While the patient is in this condition any reasonable suggestions may be made and they will be followed. In this way all the symptoms of hysteria are often obliterated at once, and remain so during the sleep. Certain habits cease, too. In order to obtain more lasting results, the suggestion must be made, that, after waking, he will not have certain

symptoms or desires. These suggestions must, however, be specific. General suggestions will be of no avail. Too many suggestions must not be made at one sitting. Nearly any physician, by following the suggestions made here can produce this sleep in many cases. The first attempt will usually fail, but a little practice will enable its accomplishment. Everyone who undertakes the operation will find a certain proportion of his subjects whom he cannot influence.

Too frequent states of this kind of sleep are decidedly injurious. Unless the physician has confidence in himself, a good self-control, and can maintain a good degree of calmness, he should not try any experiments of this kind, for he will be sure to do much more harm than good. It may be used not only to correct the physical symptoms, but wrong beliefs, fear and the like.

The simple, plain, suggestive method, without any attempt at hypnosis or sleep, any physician can and should use in his practice almost daily. The suggestions may be made in words or in actions. Here, too, the suggestions must be specific, and not too many at a time. The patient's mind must be attracted to the idea desired, and kept in some way in that special direction. Here a perfect confidence in the truthfulness and integrity of the physician, on the part of the patient, is a positive necessity. There is but one way to obtain this. The too prevalent idea that a physician must depart from the truth is all wrong. It does incalculable harm. No physician can be anywhere nearly as successful in the relief or cure of disease if he is not perfectly truthful at all times. I do not mean to say that there may not be times when he may withhold certain facts, but that he must never lie about them. This is not for its moral effect at all, but purely its professional aspect in relation to the cure of disease.

NEURASTHENIA.

Synonyms. — Nervous Prostration, Nervous Exhaustion.

The modes of business and of life tend to increase the frequency of this disease. It may affect either men or women. It is not a clear-cut, well-defined disease. Many persons with idiosyncrasies, especially fear, are pronounced as neurasthenic. There may be any grade from very slight chronic fatigue to a very profound exhaustion both mental and physical. It is possible to be affected at any age. It may be primarily the result of predisposition to nerve trouble or it may be acquired. It absolutely must, however, always follow a sufficient cause. When the neuropathic temperament is present, this sufficient cause is not as great as in those of natural strong, resisting powers.

The neuropathic temperament, that is, the low resistance to dis-

turbance of nervous function, may be the result of heredity in any of the ways that have been mentioned over and over. Wasting disease of any kind may produce a predisposition to nerve trouble and a consequent susceptibility to this disease.

Any long-continued, nearly constant irritation may cause it directly. This includes every possible source of reflex irritation from eye strain to chronic joint disease. Any emotional disturbance, if frequently repeated, or continuous and persistent for a long time, is a sufficient source. Dissipation of any character over a period of years may produce it. The dissipation may be in a laudable cause, as in church work, charity, in home duties, too close application to business, too hard continuous study, or in the things that are usually classed under the head of dissipation. Sexual causes will be considered separately. Neurasthenia, it is claimed, may be toxic. I cannot agree with this; when it is toxic, it is not neurasthenia, except that it may reduce the nutrition of nerve tissue and thus become a symptom of the toxemia; but the diagnosis should be toxemia. I am sure that there are many cases that could be much more readily cured, if the medical world were not so easily satisfied with a diagnosis of nervous prostration, or neurasthenia, but would at all times endeavor to get at the real, genuine, foundation, and name the disease properly. The benefit is not in the naming, but in the stimulation to a thorough examination in the treatment. There is one prominent immediate cause for neurasthenia. It may be congenital or acquired. I refer to worry; grief I have intended to include under the emotions. Worry is congenital when the result of prenatal influence, and is a part of the temperament, a part of the person. It is not uncommon to see quite small children always fretting and worrying.

In other cases worry is an acquired habit. There may be originally some cause, but the removal of the cause does not stop the worry. Then there are a very large number of cases in which there is a real cause for constant worry. It may be in the home circle or in the business affairs. Worry is begot of fear and discontent. The human being should not be contented in the full meaning of this term; for then all progress would cease, but there should not be a discontent of the worrying or fearful kind. No person can be entirely free from causes for worry, but they can prevent the influence of it in many instances.

Symptoms. — The most prominent symptom is that of exhaustion combined with emotional disturbance. Very little work tires. Very little excitement pleasurable or otherwise causes fatigue. Usually there is a marked tendency to be irritable, but not always. This feeling of exhaustion or prostration is not at all uniform. There will be

days when the patient can accomplish a great deal without feeling it at all, and other days when very little can be done. It is quite a common thing for the neurasthenic to feel for a time better while at work or immediately after some pleasurable excitement, only, however, to be followed by a greater sense of depression. The neurasthenic is quite apt to feel decidedly worse in the morning, especially after a good night's sleep. He gradually grows better during the day as he gets more and more interested in the daily affairs.

In almost every case there will be present more or less of the time an indefinite feeling of fear causing marked temporary and general sense of depression. It may be fear of insanity, of sickness, of home or business interests going wrong. I want to emphasize very strongly one special symptom that is rarely absent. It is indecision. As a rule the pronounced neurasthenic cannot come to a decision in any matter either great or small without the greatest effort. It is the same whether it is in regard to home affairs or matters pertaining to the social life or to the occupation. The smallest trifle assumes great importance and must be considered over and over again. For instance, a man noted for quickness and firmness of decision in the most weighty matters on going into a room at home, has difficulty, without the least cause, in deciding which of two chairs he had better sit in. It is the same with every act of life. This indecision is not the result of a loss or a weakness of the intellect. The mental ability is not, as a rule, impaired except in very severe cases. There is giving of prominence to trivial things, and the inability to concentrate the mind and to easily correlate the factors essential to a decision, and not a loss of the power of judgment. Mental effort causes depression quickly, however; loss of memory is frequently complained of, but this is rather a constant concentration of mentality on one's self, and not in fact an abridgment of the power to remember.

In severe cases there will often be an inability to recall anything when making the effort, but when not trying at all that very thing will come into the thought.

It seems that the very effort to fix the attention prevents the action of the memory at the time.

A peculiar general muscular tension is a very marked and quite constant symptom. The patient is inclined to clinch the hands tight, or to hold the arms and legs in rigid extension when sitting or lying quietly. It is not intentional; they are not aware that they are doing so. They can by volition relax, and should be taught to do so.

Another almost universal symptom is the fact that conversation even with their own family or most agreeable friends fatigues more than almost anything else. They will want to talk, but will be very much

exhausted after it. Another peculiarity is a great dread of meeting strangers. There is always danger of a neurasthenic becoming a hypochondriac. There is nearly always a hypochondriacal element present.

Headache.—This symptom is found in nearly every case. The most common form is a sensation as if that part of the head above the eyes were very heavy. There may be a feeling of pressure within the skull, or as if the skull were too full, or a hard, splitting headache. The pain however is usually of a dull character. There is nearly always a disinclination to make mental effort because it tires the head. The patient finds it difficult to concentrate the mind.

Vertigo.—Frequent transient sensations of dizziness or as if they would fall are quite common. The neurasthenic is quite apt to have very transitory attacks, in which everything goes from him. This lasts not to exceed two or three seconds, and may or may not be accompanied with fear of falling or vertigo. It is quite common for the patient to be listening to another person talking or reading aloud, even to be reading to himself, and suddenly realize that he has not heard nor comprehended a word for some time.

Insomnia.—This is a very frequent, persistent and annoying symptom. It may assume any form. It is probable, however, that it is most commonly an inability to get to sleep. The patient will feel sleepy, lie down or go to bed, and gradually wake up, and have not the least inclination for sleep. While some patients are very restless, many will lie for hours perfectly quiet. After once getting to sleep this class are quite likely to sleep continuously several hours, but awaken unrefreshed.

All the special senses are likely to be irritable. The optic accommodation is often somewhat weakened. The ophthalmoscope does not show any internal eye changes.

There will be a general sense of muscular fatigue irregularly for varying lengths of time. There is no paralysis.

There is nearly always an intention tremor. Very slight muscular exertion will cause tremor. Emotional disturbance of any kind may cause tremor. The patient gets angry, not very angry either, and it may be some time before the hand will be steady enough to write at all plainly. The eyelids when closed often show some tremor, and the muscles about the mouth also, especially under emotional disturbance. On protrusion there will usually be slight tremor of the tongue. In some cases exposure to the air of any part of the body usually covered will cause tremor. The tremor is of a fine fibrillary character.

The knee jerk is usually exaggerated, as are the tendon reflexes in

the arms. There is likely to be muscular irritability, with a tendency to exaggerated motions. In some severe cases there will be at times marked inco-ordination for short periods. There is never any paralysis. There may be stammering. Pains may occur in various parts of the body, but are not characteristic, or constant.

Paresthesias of various kinds are always present. Cold feet and formication are the most common of these. Pressure in any nerve area is likely to produce the sensation, as if the part were going to sleep. The sensation is especially frequent in the ulnar region. Itching about the anus is very common indeed. Very often areas of itching will appear and disappear on various parts of the body.

In a very large percentage of neurasthenias there is a pronounced falling out of the hair.

The circulation is very easily influenced. Blushing in spots on the slightest provocation is quite frequent. Palpitation of the heart is usually easily produced, or may occur spontaneously. There will be other heart symptoms as well in many cases. There may be a sensation as though the heart has stopped, or when lying down with the ear on the pillow, the heart beats may be distinctly heard. It is quite common for the heart action to be somewhat accelerated. With or without cause, there are apt to be attacks in which the heart beat will become small, weak and very rapid for a few minutes or maybe hours. Occasionally a case will be met in which there occurs a rise of 1° to 3° F. in the temperature nearly every day.

Disturbances referred to the digestive tract occurring during or as a result of digestion are nearly always present. At times there may be a real indigestion. The digestive disturbances are prominent, and will always require special attention. The indications are of almost any variety. It will frequently be necessary to analyze the stomach contents after a test breakfast. In many cases a low secretion of pepsin and of hydrochloric acid will be found. Occasionally there are short periods of excess of hydrochloric acid, and consequent stomachic pain. The bowels, while frequently constipated, are not at all regularly so. As a rule, unless the patient has been previously constipated he will not be at this time.

The urine is a very important element. An occasional analysis of the twenty-four hours' urine should be made. This should be a complete quantitative analysis. In nearly every case of neurasthenia the excretion of phosphoric acid will be considerably below normal. In many cases the urea will also be found below; on the other hand, this may occasionally be found above the normal. Uric acid also varies somewhat, but is usually below the normal. In fact, the urine is quite

likely to be low in solids. As the patient improves, the urinary excretions become nearer the normal standard. This is a very safe and reliable way of comparing the patient's actual condition from time to time. The urine itself, as to quantity, will vary quite widely from day to day, but this is only in the watery element. The solids do not fluctuate materially, except with positive changes in the condition of the patient. When the patient is particularly nervous, there is likely to be the usual large quantity of what is termed nervous urine. Sugar is not infrequently found in small quantities, but albumin almost never. When the oxalates are found, as is sometimes the case, there is some condition aside from neurasthenic disturbance. This is important, in that it may sometimes point to the cause of the disease. It must be corrected if the nervous prostration is to be cured. Many cases of oxaluria have been diagnosticated and treated as neurasthenia, usually with indifferent results. In these cases, had a correct diagnosis been made, the physician would have directed the treatment accordingly, and with much better results.

The general nutrition may not be affected in the least. Many neurasthenics are the picture of health, so far as appearances go.

No two cases will present the same combination of symptoms. Very many symptoms will be frequently found not enumerated here.

A case can hardly be properly diagnosticated as neurasthenia that does not present these few characteristics: The sense of fatigue, the increased mental and motor excitability, fear with despondency as to ever being well again, increased tendon reflexes, increased excitability of the heart and vasomotors, the urinary deficiency and the tremor.

Diagnosis.—The diagnosis must be made first by exclusion, secondly by the positive presence of nearly if not all the symptoms mentioned in the summary above given. In the early stage of dementia paralytica an error in diagnosis may easily occur. However, the diminished or lost knee jerk, the absence of or very sluggish pupillary reaction and the appearance of the disk are sufficiently characteristic to make the differentiation. Disseminated sclerosis can also be differentiated by the always present and essential physical signs. Cerebral and spinal syphilis may present many of the symptoms of neurasthenia and a neurasthenic may have the specific history, but there will always be present positive evidence of cerebral or spinal disease that cannot possibly belong to neurasthenia. It must be remembered, however, that it may be possible for neurasthenia to be present with other diseased conditions. This simply emphasizes the necessity for a thorough and complete examination; for only in this way is it possible to separate the essential points of each. The differentiation from hysteria is

often impossible. The patient may have both of them at the same time. Every case of neurasthenia will have a hysterical element, will have many symptoms belonging to hysteria, but they will never be as variable as in hysteria, nor do any of the paralyses, hyperesthesias, anesthetics, or the spasms ever belong to neurasthenia. It must never be forgotten that neurasthenia cannot exist unless there has been a sufficient cause to produce it.

Prognosis. — This is a chronic disease essentially. It usually increases very slowly for one, two or three years, and then remains stationary. There will however be varying periods during which the patient is markedly better or seeming entirely well. If the mental depression is a very prominent feature, there is danger of melancholia with a homicidal tendency. Suicide has occurred in a number of cases of pure neurasthenia. The disease may be arrested at any time. Under favorable surroundings and proper treatment a cure can usually be established in from six months to two years. There are a few cases in which a cure seems impossible. Many cases fail of cure for want of means. In many other cases the circumstances surrounding the patient are such as to prevent the possibility of a cure. In other cases it is impossible to remove the cause, and as a result a cure is not to be expected. In a person who has the congenital worry habit a cure is very difficult.

Treatment. — Prevention should be the first consideration. This can be accomplished in a measure by the training of children. That which will be found under hysteria under this point is equally applicable here. More stress should be placed on the training in regard to fretting and worrying, however. If there were no worry in the world there would be very few cases of neurasthenia. The parent through the advice of a physician should watch carefully to see that the physical and mental are developed somewhat harmoniously. Give every child a strong physical body, and neurasthenia would be very much more rare. Precocious children must not be allowed to learn rapidly, and the backward child must not be forced too rapidly. The physician has a plain duty in watching every family under his care, and advising strenuously against all excesses. He should note the very first tendencies of fatigue, and do all in his power to cause the patient to cease those things that are likely to lead to this disease. He should, whenever he finds cause for worry existing, do what he can to get the cause removed. If there is dissipation of any kind, advise moderation. The physician should at all times endeavor to get those for whom he is responsible to keep from fretting and worrying. This is not as difficult a task oftentimes as it would seem. By constant and repeated effort it is possible with a majority

to get them to thinking of the brighter side of life. Nothing can be accomplished by telling a person not to worry. A person cannot stop worrying by volitional effort. However, if when there is cause for sorrow or worry a person will look for, and try to think of, a pleasant element, it can always be found. There is nothing so bad or dark that a bright contrast does not exist somewhere. Let everyone emphasize the good, the cheerful things in life.

After neurasthenia is present the treatment must be dependent on the cause. Where there is a physical cause such as reflex irritation it should be removed or corrected at once. If the source of trouble is in social life or philanthropic efforts, correction may be easy. If there is too close attention to business, or to study, the way is clear. There are many causes that it is possible to remove or correct. On the other hand, in case of a mother or father with a dissipated child, a wife with a brute for a husband, the removal of the cause may not be an easy matter. If financial or business reverses are at the bottom, it may not be possible to remove them, and so there are many times that it will be found impossible to correct the cause. Where the cause has ceased to exist, or after you have removed or corrected it, the subsequent treatment must be modified in every case according to the producing cause. Too much stress cannot be placed on this subject, the removal of the cause, whether it be physical (such as astigmatism or hyperopia or irritation of prepuce clitoris or rectum) or mental.

The next step in the treatment calls for just one remedy and only one remedy — *rest*. It will require, however, the best intellect of the physician as well as long experience to learn how to use this remedy correctly, how to fit it to an individual case. Rest must include every degree of relaxation from full labor to absolute mental and physical inaction. It must include the substitution of one kind of activity for another. In order to know how to use this remedy the physician should familiarize himself to a considerable extent with the details of every calling and every form of life's activity. He must also make himself thoroughly familiar with the patient's life to the extent of very small details; with the temperament, predisposition and all environments. To Weir Mitchell belongs the credit of devising and giving to the world a system by which the most complete mental and physical rest can be obtained. The securing of practically absolute physical rest is a comparatively easy task. How to arrest the activities of the mental man seemed a difficult problem. As soon as it was demonstrated that the withdrawal of the attention reduced or arrested mental activity, the problem was in a great measure solved. The full rest treatment requires the closest attention to every detail. The first essential is a

pleasant room, well aired and accessible to the sun's rays. It should be as comfortable as possible in every way. The walls should be plain, either white or some neutral tint, no figured paper. There should be no pictures on the walls. The furniture should be plain and just enough for the actual needs of the patient and nurse. The room, except when unavoidable, should not be in the patient's home. The patient is put to bed in this room, the bed being placed so as not to give the patient a view of anything except the sky and trees if possible. The nurse should be a stranger to the patient. She should be mild, calm and self-possessed and not a talker. No living being except the nurse and physician must be allowed to come into the room or to come in contact with the patient in any way. Every effort must be made to keep conversation or other sounds from penetrating the room. The object of all this is to take away everything so far as possible that can possibly attract the mental attention. In a large proportion of the cases it will be difficult to get the consent of the patient or family. They are honestly of the opinion that to be shut up in this way will drive them crazy. The rule is that they are somewhat restless the first day, less so the second, and by the third or fourth day are perfectly contented.

The patient is kept in this room for a varying period of from four to eight, or possibly even ten weeks. The diet is the next element to receive attention. The nourishment must be more than the ordinary requirements or desires. The patient must not be overfed. The nourishment must be liquid in the main, and such as can be digested and assimilated with the least possible expenditure of force. Weir Mitchell's regular diet was, at the beginning, skimmed milk, to be taken at intervals of two hours during the day, and several times during the night. The quantity for the twenty-four hours is from three to five quarts. It is not essential that this one article of food should be adhered to. There are many preparations like the Malted Milk or Barley, Eskey's Food, Liquid Peptone, and a host of others, that fulfill all the requirements. But the regularity, and at frequent intervals during both day and night, and the quantity are essential factors. The bowels must be made to move once a day fairly free. This may be accomplished, pleasantly in many cases, by a cup of strong coffee, without cream or sugar, every morning, or any mild cathartic may be given as needed. A thorough catharsis should never be produced.

The next detail of this treatment is massage. General massage, which shall include every possible muscle, must be given daily. There must be deep kneading of the muscles, and surface rubbing and spatting. The operation should occupy not less than an hour. The nurse should be an efficient and competent masseur. The next item of the details is

the use of electricity. Central galvanism should be administered once every day for about twenty minutes, from three to seven milliampères in strength. The faradic current should also be given, once each day. With one pole under the cervical spine for the trunk, the head, neck, and upper extremities, and under the lumbar spine for the lower extremities, as fixed points. Large, flat electrodes should be used. The opposite pole is now to be applied to the motor points, in all parts of the body, the current being of sufficient strength to cause fair muscular contractions. This treatment will occupy about an hour. A sponge bath, for cleanliness, should be used daily. When the patient is ready to be prepared for activity again, first, purely passive motions of the various muscles must be made; later, passive motions, including graded resistance on the part of the patient and operator. At first only once each day, later, increase to two or even four times a day. The patient may then be allowed to take a gradually increasing amount of volitional exercise, daily. The transition from absolute quiet to fair freedom of exercise should require from two to three weeks.

This line of treatment is especially adapted to those cases that result from those things ordinarily termed dissipation. Also for a class that might properly be called acute neurasthenia, that is, those cases in which from some sudden cause, there quickly follows a very profound prostration. If it is from some great grief, and there is more of an element of grief or melancholia than of prostration, this line of treatment is not indicated. If the cause is long-continued, close application, this remedy, rest, is usually to be found in the way of outdoor physical exercise, sawing wood, chopping, horseback riding. Judgment must be used, so that injury shall not be caused, by going at these things too violently. Where the cause is largely a too active life in business or philanthropic, or church work, in addition to home duties, it is not wise, as a rule, to stop everything without substituting something that will occupy the attention. Many patients have been seriously harmed in this way. They may take a trip, row or fish or hunt, and the like. Many times it will be utterly impossible for the patient to get away from home or business; in those cases, the business or home affairs must be so arranged as to require and receive a minimum of attention; collateral things they have been doing must be stopped, and amusement advised. There must also be a certain amount of absolute quiet rest, lying down during the day. The patient should be instructed how to relax every muscle in the body. If the source of the trouble is a too active emotional life, as the board of trade, and kindred occupations, an ocean voyage, and sight-seeing, or a fishing or hunting trip, will supply rest. The essential thing is to have the *rest* consist of pursuits

as different from the regular everyday life of the patient as possible. A minister, for instance, will not rest from a sight-seeing or visiting trip. It is impossible to suggest all the ways to fit all the cases. The physician must, with the full knowledge he has obtained regarding the life of the patient, and the circumstances of the individual, use his utmost ingenuity many times, to devise a plan that will give *rest*, that will not be as, or even more, tiresome than the things the patient has been doing.

In many cases the full rest treatment may be modified to any degree, simply retaining the general outline and fundamental principle.

Nourishment.—Every neurasthenic must be fully and thoroughly nourished, must be overfed. The food must in the main be of a character to require a minimum expenditure of force in being digested. Any one of the many invalid or baby foods may be of use. Food should in all cases be taken between regular meals. Any digestive disturbance that is present must be carefully and fully corrected. Full directions for the treatment for the digestive troubles will be found in other sections of this book.

The bowels must be regulated by such means as seem best adapted. This is important in neurasthenia. The analysis of the urine having been made as suggested, the findings must be considered in the treatment. The urine will be the main guide as to any special line of diet. It will also, to some extent, indicate remedies to be used. Where there is a deficiency in the urea or uric-acid excretion, Lithia Benzoas C. P. will be indicated. I give doses of one-fourth grain in half a glass of water before each meal. Occasionally, instead, I prescribe the manufactured lithia waters. While I employ, in many cases, the natural waters, I always, when particular as to the patient's getting lithia, use a manufactured water. If the phosphoric acid excretion is low, the glycerophosphates of lime, sodium or lithia may be used with certainty of obtaining good results. Give two-grain doses dissolved in distilled water, three or four times per day. I do not class the glycerophosphates as medicines, but as nutrients. The analysis of the urine may frequently be of service in selecting the treatment for the digestive disturbances, as well as for other elements in the case. In a very large number of the cases, physical exercise, not merely walking, and the like, but regular gymnastic exercises, should be taken with great regularity and system. Very careful attention should be given to correct breathing in connection with the exercise. Many times very marked benefit has been derived from careful training in the breathing. It will usually have a decided influence in helping to produce sleep, and on the digestive apparatus, as well as on the nerve nutrition.

Massage is indicated in nearly every case. It should be given by some one well versed in the effects to be derived from the various manipulations.

Electricity is also likely to be decidedly useful in nearly every case. All the forms are of service in neurasthenia. In individual cases, there may be special symptoms or conditions calling for special applications of electricity. In most of the cases, however, general treatments looking to increased nutrition and the regulation of the circulation will be indicated.

Hydrotherapy, in the hands of one understanding its uses, and experienced in the several methods by which it can be applied, is most valuable. Decided harm, however, may be done by its improper use.

For the insomnia it will at times be necessary to use hypnotics. The bromides, chloral or opium, should never be used in a case of neurasthenia. Those mentioned under hysteria will be applicable in this disease and in the same way. Sleep should, and usually can, be produced through the agency of massage, exercise, breathing, electricity, or by hydrotherapeutic measures. Suggestion will very frequently prove of great service in neurasthenia.

SEXUAL NEURASTHENIA.

This subject demands some special consideration. An entire volume could easily be written on it without exhausting the subject, and yet what need be said can be put in a small space.

The general symptoms are the same as those of general neurasthenia. In fact, a pure neurasthenia caused by sexual conditions is the same as any neurasthenia. Here again worry is the greatest producing factor. A very large proportion of the cases of sexual neurasthenia are the result entirely of worry about sexual affairs, and in no way caused by sexual irregularities. The most frequent form is the worry over the injury that has been done by masturbation. Nearly every man has at some time in his life practiced self-abuse to a greater or less extent. He reads in an advertising pamphlet, prepared for the susceptible, of the direful effects of this habit. He at once begins to look for the symptoms mentioned, and no living man can fail to find some one or more of them. Having one or more of these symptoms and having practiced the habit, he is at once convinced that he has injured himself. He now begins to worry, and look for other symptoms, and it is not long before he has from mental suggestion a train of symptoms. It now becomes difficult to concentrate the mind on any subject to the exclusion of these thoughts. If he is a man of moral character, he is quite certain to have had more or less night pollutions. These emissions during sleep or just

on the verge of sleep, accompanied with sexual dreams are likely to increase in frequency as a result of the attention being concentrated on this subject. The case is clear — there is a pronounced neurasthenia with loss of memory and other special symptoms added. In examining these cases the history is of great importance and a part of the treatment should be applied during the taking of the history. The patient is asked at what age he first began the practice, at what age he stopped it. How frequently on an average per week he practiced it. How he first learned of its injuriousness, whether from a pamphlet, from some friend or from a physician. (There are physicians who from ignorance or cupidity will talk just as these pamphlets read.) If, as is the case so many times, the habit has not extended over a period of eight or ten years, and it has not been a daily habit for a long period, the physician should drop the remark casually that he must look for some other cause, as it is absolutely certain that this habit cannot have been of any harm. The examination is to be continued for natural sexual excess, which in these special cases has never occurred. Then locally for malformations of the prepuce, not forgetting to note carefully whether the external opening is large enough. If, when the prepuce is drawn back over the glans, there is a point that looks as though a small thread was drawn around the shank tightly and buried, either circumcision or a slit operation must be made. The frenum must be examined, and if attached too far forward, it must be severed. The meatus and urethral canal must be examined for stricture. Very frequently a stricture just within the external meatus will be found, or the external meatus itself will be much too small. There may be other anatomical causes for irritation in the parts. Next, the rectum must be carefully scrutinized with a speculum. Any irritation here may be a source of sexual irritation. If any abnormality is found, it should be corrected at once. If not, you are ready to continue the treatment. No physician can treat these cases with success if his dominant idea is to make money. He knows he has a patient who will spend his money freely, all he possibly can, and for almost any length of time. This is one form of disease in which patients seem to like to pay out money. In the proper treatment, however, there is no money for the medical man, worth speaking of. The treatment must be entirely psychical. There is one thing absolutely essential, and one thing only; that is, to convince the patient that he has not injured himself, that the habit as he has practiced it cannot possibly have injured him. That all his symptoms are the result of his worry — of his concentration of attention on this subject, and that the emissions so far as they are abnormal will disappear when he no longer thinks of them. Then compel him to go about his business, take no medicine, see no doctor

not even you, talk to no one on the subject, let emissions come or not as they please. The prescribing of any medicine or of any form of treatment will prevent a cure. You cannot disabuse a mind of a sick idea, so long as you suggest or give treatment. It will often be a difficult undertaking to convince him of the truth, but it must be done. When he is convinced, the cure is made.

There are many cases of sexual neurasthenia, that result from one or more of the various local irritations in the genitals. There are a great many cases in women and girls the result of irritation about the clitoris. Sexual excesses even in married life may cause it; outside of wedlock it is very likely to cause neurasthenia. Here elements of fear and worry and undue excitement, all are features; it is not alone the act. Unnatural intercourse long continued and frequent, may produce it. Any form of pervertism may be the cause, or may be a result of sexual neurasthenia. Masturbation, if very excessive, may cause the most profound neurasthenia, or even pronounced mental trouble. This class of cases are pitiable objects.

The most frequent symptoms of sexual neurasthenia are headache, backache, general depression, loss of ambition, loss of memory, confusion of mind and physical weakness. Impotence either psychical or actual may be present in any degree, from slight inability, to absolute loss of either power or inclination to perform the act. Spermatorrhea may be present or not. It is not in my province to discuss this disease here. It can only be determined, however, through the use of the microscope. Spermatozoa may be present in perfect health, it is occasionally, even quite frequently, in the night's urine. Not so often during the day. The most of the semen passed is not semen, but mucus pure and simple. Most men have times when the ejaculation is much too quick, or delayed too long. It is not uncommon for them at such times to get frightened, and consult a physician at once. There are many transitory causes both psychical and physical for this. The sexual sphere is exceedingly sensitive, and is easily influenced by almost anything. Incomplete intercourse has produced in men sexual neurasthenia. In women it is a very common source of this trouble.

Treatment.— Suggestion is a prominent factor in the treatment always. The correction of any bad habits is essential. This can be accomplished through advice or by physical means. In some cases restraining harness is absolutely essential to the prevention of masturbation. In the cases of women where the cause is incomplete cohabitation it is sometimes very difficult to correct the cause. The woman must not only be told what should be, but the husband must be educated, and they must together follow directions persistently until

the desired object is attained. All sources of irritation must be removed or corrected. The digestion and condition of the bowels must be rendered as near perfect as possible. This is very important.

The various aphrodisiac and sexual stimulating drugs are always injurious. It is possible that occasionally when there is fear of inability that a drug may temporarily, tide over an emergency, and help to establish sufficient confidence to prevent the need of further attention.

Massage and all the other adjuvants mentioned for neurasthenia may be needed here.

The refrigeration of the urethra may be useful. Alternate hot and cold douches over the lumbar spine will often be beneficial.

Electricity is nearly always called for. The galvanic current is to be applied by means of a large flat electrode over the lumbar spine, and a smaller negative over the scrotum, from six to eight milliamperes. The positive electrode may be introduced into the rectum, and the negative in the urethra, or over the scrotum, using from two to three milliamperes. This current may be given daily, or on alternate days. The faradic current may be used in the same manner daily, or the negative wire may be attached to an ordinary urethral sound, this passed through the urethra and the positive pole applied over the lumbar spine. A fairly strong current should be used; that is, as strong as the patient can bear with any degree of comfort. The treatment, if possible, should be given daily, about ten minutes each time.

Among the remedies *China off.* (30.), ranks very high. *Calcareo phos.* (30x trit.), *Zinc phos.* (3x trit.), are remedies that will very frequently be called for. There are many others that will be indicated, and that will show prompt and decided results when administered. It will pay to study the materia medica in these cases.

MIGRAINE (HEMICRANIA).

Attacks of headache occurring at frequent intervals with irregular periodicity, usually unilateral and without apparent immediate cause are termed migraine.

The great factor in producing migraine is heredity. This disease is very frequently transmitted by direct heredity. In other cases it is simply the general neuropathic tendency. It is quite probable that it never occurs in anyone in whom there is not a predisposition. It is more frequently met with in women than in men. It occasionally appears in very young children, but is apt to first appear at puberty. It may appear much later.

In those predisposed, mental strain, shock or worry may be the

immediate cause. Masturbation, either physical or psychical, and sexual excesses are among the possible sources. Any of the reflex irritations, as for instance from the eyes, the nasal passages, or the genital organs, may be the special etiological factor. Chronic uremic poisoning is a very frequent cause, I am sure. Gout and rheumatism are frequent sources of this trouble.

Symptoms.—It is usual for the patient to have a general malaise, with drowsiness for a varying period of time, then for pain to appear in the head, most frequently on one or the other side, but sometimes general. It may appear in one spot or region and spread over the entire head. It may, on the other hand, remain stationary in a small area. The pain may be of any character. Rarely it appears with full force at the beginning, but more frequently gradually increases in intensity until it reaches its climax. It will nearly always be accompanied by more or less nausea and even vomiting. There will be sensitiveness to light or noise. The pain is nearly always aggravated by any motion. The attack most frequently goes off during sleep, the patient waking with a clear head but often feeling weak. It may last only a few hours or for two or three days. It nearly always runs practically the same course. The attacks may appear at long intervals or at varying intervals. In a great many cases they appear at regular intervals. The patient is able to figure that he will have an attack on a certain day. They may appear two or three times a week, or once a week, or the same during a month, or two, or three, or six, or twelve months. In women they seem to show a tendency to occur just before, during or after menstruation. Various vasomotor, sensory and motor disturbances may be present during the attack. These are of importance only in helping the physician to affiliate the remedy. Mental symptoms may also appear during an attack, but will be transitory.

Diagnosis.—This presents no difficulty, except when the attacks occur or continue to occur, as they may at times, during other diseases. Even then it is not usually hard to distinguish and separate the migraine. It will require a very full and complete physical examination, including analysis of the stomach, the blood and the twenty-four hours' urine to complete a diagnosis.

Prognosis.—The tendency is to reoccur for a period of years. In many cases it ceases spontaneously after from five to twenty years. Careful, conscientious study on the part of the physician, and strict obedience on the part of the patient will cure the majority of these cases in from three months to two years.

Treatment.—The treatment must be directed to the immediate cause, if it can possibly be ascertained. Every organ must be put in as

healthy a condition as possible. Any irregularity in the urine must be corrected. This will be found of the utmost importance in many cases. The diet must be arranged according to the special conditions in each case. For immediate relief, cold or occasionally hot compresses may be used to the head. Menthol pencil, rubbing, and various other external applications may do good. Occasionally, mustard or other warm applications over the stomach and bowels or over the back of the neck will modify or arrest the headache. In a few cases the use of an emetic is to be advised, but in most cases, while it may give temporary relief, the stomachic irregularities it induces, tend to increase the chances against a cure. Galvanism, using medium-size electrodes, may be applied transversely through the head, side to side and front to back. A very mild current should be used. The side-to-side should be alternated in direction, every fifteen to thirty seconds for four or five minutes at the longest. The front-to-back current may be continuous in the one direction. One pole should be at the back of the neck, the other may be at the root of the nose between the eyes. The direction of the current must be decided by testing; use it in the direction in which it seems to have a soothing effect. The electrodes should be put in place, and the current turned on very gradually up to a point where it begins to cause slight increase in the pain, then lowered a little very slowly until there is a feeling as though it might be comfortable, and then kept at that point as long as it seems comforting, not to exceed ten or fifteen minutes, however, and then very slowly reduced till it is all off. Treatments of this kind can be given one after another with five-minute intervals for two or three hours, with marked benefit in many instances. The use of hypnotics, narcotics and analgesics are, I believe, always harmful. If it is absolutely necessary to use anything of this kind for temporary relief, the bromides, antipyrine, antikamnia and the like may be considered. The general prescribing for cure must be found in a study of the materia medica. There are two or three remedies I merely want to name here: Duboisine (4x), *Veratrum viride* (either Norwood's tincture or the 3x made from it, according to the indications), *Ipecac* (30.) *Strychnia* (30) *Atropine* (4x or 30.), *Hyoscyamine hydrobromate* (4x trit. from Merck's), and Squibb's *Cannabis ind.* (tincture or 3x made from it).

CEPHALALGIA (HEADACHE).

This may occasionally be an entity of itself so far as we can determine. It is a prominent feature in disease of almost any organ in the body or may be the result of any toxine or of autoinfection of any character. Headache is often entirely due to circulatory disturbance either

general or cerebral migraine The nutrition being either low or irregular in some way may cause headache. In short this symptom can have almost any cause.

The diagnosis of cephalalgia or headache is not a diagnosis at all. There are a few cases in which we are compelled to make this diagnosis simply for the reason that we are unable to find the cause. The treatment must depend on the cause entirely. Here again attention must be called to the many sources of reflex irritation. Do not try to treat the headache except for temporary relief. Direct all curative efforts to the accompanying diseases or cause.

EPILEPSY AND EPILEPTOID.

These conditions are identical in their symptomatology and manifestations. The line of demarcation is in the producing cause. If the medical practitioner will cease being satisfied with the word "epilepsy," simply considering it a hopeless case, or one in which the bromides are to be used, and will recognize that there are epileptoids as well, the prognosis of this condition will be much better.

It is a condition in which at irregular intervals extending over a long period of time, the patient being apparently healthy during the intervals, loses consciousness with or without convulsions.

Etiology of Epilepsy.—Heredity is probably the most frequent factor. It is not, however, a direct heredity. There is either some mental or nervous trouble or dissipation in the ancestry. This may be the result of shock or fright to the mother during pregnancy. It is quite possible that accidents during labor or soon after birth may be the cause of a future epilepsy by causing some slight cerebral lesion, or it may be that they are simply the beginning of the epilepsy. The various meningeal and cerebral diseases in infancy and childhood are certainly causes of true epilepsy. In recovery from them there are often small foci of unnatural tissue left in or beneath the cortex, and these cause the convulsive tendency. Syphilis may cause it. Some cases follow the acute infectious diseases, especially scarlet fever. Fright may be the starting point for a pure epilepsy.

Etiology of Epileptoid.—There is no kind of irritation that from long action may not cause epileptoid attacks. In small children digestive disturbance, loaded bowels, teething, and the genitals furnish the necessary irritation in a majority of the cases. At a little later age the genitals still continue to be important irritants. In fact, irritation in these organs in either sex and of every kind is a prominent etiological factor in epileptoid. The prepuce, the clitoris, and the

cervix are the most common seats of irritation in these organs. From the tenth or twelfth year the eyes assume a prominent place in this etiology. Errors in refraction, astigmatism and muscular defects are the chief causes. It is not usually the gross defects, but comparatively slight defects, that cause these attacks. Traumatism of the head is a well-recognized cause. Infection, toxemia, syphilis, lead and alcohol, are all recognized sources of this trouble. Diseases of the heart may produce it. In the aged, atheroma may cause what is termed senile epilepsy. Sexual irregularities are charged with being the cause in some cases. Irritation of peripheral nerves or the nerve endings from being pinched in a cicatrix or from other cause may produce general recurring convulsion of this type.

The rectum not infrequently presents a sufficient source of irritation. To specify all the causes would occupy more space than can be given.

Symptoms.—All authors recognize the *Grand Mal* or severe attacks, and *Petit Mal* or mild attacks.

The *grand mal* is frequently preceded by premonitory symptoms for some hours or a few days. They are of various characters. Vertigos, general malaise, mental depression, tremor and muscular twitchings more or less general, are among the more common premonitions. Preceding the attack but a few seconds, there will be in a great many cases, one peculiar *motor, sensory, vasomotor, secretory, psychical, or visual symptom*.

This same symptom will precede every attack in the same individual. This symptom is called an aura. The aura may occasionally appear or be followed by a very light attack. It is possible in some cases to seemingly prevent an attack if steps be taken on the appearance of the aura. Each case must be experimented with in order to determine the proper steps to take.

The attack is sudden, it will be immediately after the aura, or may be without any. The patient no matter where or what he is doing falls unconscious. There is general muscular rigidity. The eyes turn up directly or obliquely, the head turns to one side or is drawn back, there is a short general tonic spasm. The respiratory muscles are included, the breathing stops a second, then there is usually a scream or a forcible or muffled cry. The face is pale. The pupils are dilated and do not react to light. The extremities may be flexed or extended, the hands clenched. But it is not common for flexion to be present at once in the head, arms and legs. In from thirty to sixty seconds the face becomes red, the tongue is pushed between the teeth, there is tremor, and almost instantly irregular clonic spasms appear in nearly every muscle; the face

becomes bluish or purple, then almost at once begins to assume a natural color. The twitching or jerking movements produced by the clonic spasm, are somewhat rhythmical and increase in frequency for one to three minutes. The respiration becomes more rapid and noisy. Then the twitchings become gradually less frequent, and stop. The body is bathed in perspiration and relaxed. The patient may open the eyes, get up and wonder what has happened, and seem perfectly well. In by far the greater number of cases, however, he opens the eyes, but does not realize anything, goes to sleep at once, can be roused, but only to a dazed condition, and immediately lapses into sleep again. If not, he is confused and dazed, has a headache, and feels somewhat lame. The sleep may last several hours. Patients frequently have an attack in the night and have no knowledge of it excepting the sore tongue where it has been chewed between the teeth, and muscular soreness and lameness. There may be vomiting at the close of the convulsion.

The temperature may be slightly elevated. The reflexes will all be absent during the attack and for a few minutes following; still in some cases they may be increased; this is rare. There may be slight capillary hemorrhages in the skin and mucous membranes.

When general muscular weakness follows the attack, it is of very short duration, simply the result of exhaustion in the motor cortex. If this lasts a considerable time, it will point toward a cerebral lesion, causing convulsion, rather than to epilepsy.

There are cases in which the patient will start up suddenly and run some distance and then fall. He may have attacks of this kind, and at other times typical attacks. A full typical attack does not always appear. There may be modifications of nearly any nature. The same person will have modified or full attacks at different times.

Petit mal or the light attacks may be nothing more than a sudden loss of consciousness. This may not even cause the patient to fall or stagger. There may or may not be an aura, usually there is none; the patient for a very brief period is simply entirely unconscious. It is not uncommon to find patients who do not know that they have these attacks at all. The face usually is slightly pale, the eyes are fixed, and slight twitching of the eyes and lips may be noticed. There may be any degree from this to a full typical attack. At some point they cease to be light and become major attacks.

In this connection I want to refer to the hysterical convulsion, or to what is termed *hystero-epilepsy*. The attack may or may not be preceded by an aura. It will be sudden, but more frequently follows almost immediately some emotional disturbance; not always,

however. It never occurs during sleep. It probably rarely if ever occurs when the patient is entirely alone and beyond the hearing of anyone. There is not an absolute loss of consciousness. There is frequently a marked opisthotonic convulsion. The head, arms and legs are all usually extended or fixed at the same time; the hands may be clenched, but are usually extended or clenched according as the arms are extended or flexed. The convulsion does not usually follow the typical stage, although it may. The clonic spasms and resulting movements are such as it would be possible to make by volitional effort. There is no twitching or jerking of the eyeballs. There is rarely any involuntary discharge of urine or feces. The attack may last longer. Different attacks in the same person are likely to vary widely. The relaxed stage is not usually one of sleep. The patient will be too sound asleep, or not enough so, as a rule. The reflexes are usually present, the pupil will react to light.

There may be in place of a convulsion, or following immediately after a convulsion, a mental state, in which the patient will do many things in an apparently intelligent manner, sometimes quite difficult and complex things, but without the least remembrance of it after; that is, the patient is for a short period in a state of somnambulism. There may follow, very soon after an attack, decided mental symptoms, incoherence of thought and speech. The patient seems to lose all reason, all self-control, and may steal, or commit some other crime, or expose his person, or take off his clothing wherever he may be; that is, the patient is, for a short period, insane. There may be decided hallucinations, apathy, or dementia, causing, sometimes the most serious crimes. This state may last a few hours or weeks. After it is over the patient has no recollection of anything that has occurred. Attacks of this kind may appear without any convulsion; seemingly in place of a convulsion.

Jacksonian Epilepsy.—A form of epilepsy caused by irritation in the motor cortex bears this name. The cause may be a diseased condition of this part of the cortex, or it may be the result of traumatism. A spasm, nearly always without an aura I believe, will appear in some set of muscles, on one side only. This will often be followed by spasm, of that entire half of the body, and not at all infrequently by a convulsion, affecting the entire body. It may commence in the muscles of the face, hand, arm or leg. It spreads in the order of the different motor cortical centers. It is usually first a tonic, then a clonic convulsion. It may be confined to one member, in that case there will be no loss of consciousness. If it affects one entire side of the body, consciousness is often lost. If the entire body is affected,

there is nearly always entire unconsciousness. It is claimed that this may be hysterical. The local spasms in hysteria are so different from a true Jacksonian, and are so characteristic of hysteria that they can hardly properly be included. Alcohol and lead poisoning produce sometimes a series of convulsive attacks that may belong to this class. Nearly always there will be, for a short time, paralysis in the muscles first attacked, and occasionally of the entire side. Those first attacked are, however, the last to recover. There may, after a number of attacks, remain a permanent paralysis. Then again there may be an attack, occurring during a permanent paralysis, commencing in the paralyzed muscles and spreading to the others.

The status epilepticus is a condition in which the epileptic attacks follow each other at very frequent intervals for a longer or shorter period. They may be only a very few minutes apart, or they may occur at half an hour or an hour or longer intervals. During this state the temperature is quite likely to be elevated from 2° to 4° F.

In the *reflex* cases caused by irritation of the peripheral parts of hand and foot from injury, there is usually an aura, consisting of some peculiar sensation or a twitching starting from the point of injury. It may not go much beyond this point of starting for some time. In succeeding attacks the tendency is to extend nearer and nearer the trunk, till finally there is unconsciousness and a full attack. Paralysis in the member in which the injury is, will last a short time after the attack. The wound will nearly always be sensitive all the time. Striking or hurting the scar in any way is likely to bring on an attack. On the other hand, when the aura is felt, the tying of a string or bandage around the member tightly above the point the aura has reached, seems to have averted a great many attacks.

An epileptic may have a perfectly normal, even a great mind after having many attacks.

Many times there will be some of the usual signs of degeneracy and in some cases permanent insanity, dementia or idiocy finally result. In these cases there is of course always cerebral disease.

The feeble-minded child is often afflicted with epilepsy as well. In some cases the feeble-minded have in place or as an equivalent of epileptic attacks, more or less pronounced maniacal attacks during which they are absolutely unable to exercise any control, and are devoid of any responsibility. During these attacks they not infrequently commit serious crime.

Eclampsia. — This term is used to designate general convulsions occurring in childhood, and also in women during pregnancy, during or right after labor.

In children the attacks are identical with epileptic attacks. Many of the acute infectious diseases of childhood are ushered in with an attack of general convulsions. Diseases of the stomach or intestinal tract, stomach or intestinal worms, pin worms in the rectum or neighboring parts, may be a cause. Errors in diet, as green fruits, are frequently followed by attacks.

Attacks are quite common during teething, but not as common during the second dentition as the first. Repeated attacks of general convulsions often occur in the course of rhachitis. Hernia, especially inguinal, may also produce them. These convulsions may come as a result of emotional disturbance or shock. There are a great many cases in which no cause can be assigned.

These attacks while identical with those of epilepsy are rarely complete. Often there is not entire lapse of consciousness. In the main it is impossible, however, to distinguish these attacks by the observation of one or two of them.

In many instances there is but the one attack, frequently they will recur at longer or shorter intervals, of one to eighteen months.

Children having a series of these attacks are likely to have either genuine epilepsy or hysteria develop later in life.

Parturient cases are nearly always due to acute nephritis, they may be the result, however, of pressure of the uterus on the ureters or possibly but rarely to chronic nephritis. They are essentially uremic convulsions.

The prognosis is always serious.

The treatment of parturient cases does not belong to the neurologist, but I may be excused for suggesting a few points. The uterus must be emptied as soon as possible. Bleeding from the arm may be essential. Chloroform anesthesia to a point sufficient to control the spasm may be necessary. The administration of chloral hydrate or the bromides, or a mixture of the two, may be the best procedure.

Veratrum viride Norwood's tincture in from three- to five-drop doses every fifteen to thirty minutes, has saved many lives. *Sabina* tincture in from five- to twenty-drop doses every fifteen to thirty minutes, has also been efficient in many cases.

Diagnosis.—A diagnosis can never be made from a single attack. There must be a carefully taken history. This must include specifically all things during the twenty-four hours previous to an attack for each of several seizures. It must specify just what may have occurred immediately preceding, then each stage of the attack as minutely as possible, the length of time and the conditions following up to full recovery.

The history must also detail the condition of the patient between the

seizures. A full detail of any possible prenatal predisposing causes must be recorded. That is a full and complete history as suggested under general Methods of Diagnosis. There must be in every case a full and complete physical examination including every organ.

The differentiation between epilepsy and epileptoid is simply that in true epilepsy there is no sufficient immediate cause or source of irritation to be found; that is, there is no present disorder or direct or reflex diseased condition that can be determined. In epileptoid there is a present producing cause that can be diagnosticated. This is in a sense a fanciful distinction, but in my opinion it has a tremendously practical bearing on the prognosis. If it is once fully understood that a differentiation should be made, a very large number of cases will receive the treatment needed and be cured, which would not without this distinction.

The differential points from hysterical convulsions are, I think, clearly set out under the symptoms of hystero-epilepsy. If any organic cerebral disease is present, the attacks are likely to be of longer duration than from simple epilepsy. In any case in which the convulsion lasts over ten minutes, special care should be taken to examine for evidences of cerebral trouble. There will also be present evidences of brain disease between the attacks while in epileptoid there will not.

There may be a true epilepsy and organic disease coexisting. There may be a true epilepsy and reflex irritation or cause for the same both present in a case. Under these circumstances only a tentative diagnosis can be made.

There may be a true epilepsy and hysteria at the same time, or an epileptoid and hysteria conjointly.

Great care, caution and the most rigid examination and investigation should always precede a diagnosis of epilepsy.

Prognosis.—That of true epilepsy is always doubtful. The patient does not lose life, but a comparatively small percentage of cases recover.

In the epileptoid it is very much better. If the cause is removable, subsequent treatment will usually result in a cure. In giving the prognosis, the physician should always state the possibility of the existence of a pure epilepsy underneath.

In Jacksonian epilepsy, operation has been successful in many cases.

In infantile eclampsia the prognosis is good. The more frequent and severe the attacks, the more doubtful is a probability of a cure.

If the attacks can be made to appear at increasing intervals and grow uniformly less severe, the chances for a cure are good. The fact that a patient may go for a long time, and with only very slight seizures, and then have a series in rather quick succession and even of great severity,

does not militate against steady improvement. A case cannot be safely considered as cured until at least three years without an attack have elapsed.

Treatment.—The first consideration is the complete history and thorough examination. Determine whether it is a true epilepsy or an epileptoid. If it be a true epilepsy, there is but one proper method of treatment. While this does not promise very much, yet I am very sure that the results are very much better than under any other method.

This consists in the most careful study of the patient in all phases with the object in view of affiliating the remedy. In this disease the remedy must be affiliated to the patient. There are very rarely differentiating symptoms of any value in the attacks. If there happens to be a specially peculiar and unique symptom during the attack it must be considered in selecting the remedy. On the other hand prescriptions based on the symptoms alone cannot be reliable.

The heredity, the predisposition, any dyscrasia or blood poisoning, the special idiosyncracies, the habits, the modalities, in fact everything that in any way distinguishes the patient from his fellows, must be carefully tabulated, and then the remedy most closely covering the entire case is to be given steadily for a term of months. If it has been selected with proper care, there is not only no reason for changing it at all frequently, but positive harm must result from so doing. The higher potencies seem to be the most efficacious. I do not recognize any one remedy as more likely to be indicated in this dreadful disease, than any other. There are no remedies that can be considered as epileptic remedies.

A stomachic and urinary analysis will enable the physician to prescribe the best diet. In every case, careful attention must be given to the digestion and the general nutrition. All spices and condiments, in either food or drink, should be prohibited. All irritating food or drink should be forbidden. The patient should not under any circumstances use alcohol in any form. Meats should be used with great moderation. If the attacks show a tendency to occur during the night, the night meal should be very light and taken quite early.

Excitement of every kind should be avoided. The patient must have a full amount of outdoor exercise. Physical culture or regular gymnastics are advisable.

In cases in which there are pronounced mental symptoms, or in the feeble-minded in which epilepsy is an incident, the patient should always be placed in an institution and kept there. This is for his own protection, as well as for his family and friends.

The cold hydropathic treatment may assist in a cure. The usual treatment is the administration of the bromides. There is a great

diversity of opinion as to the best method of administering these drugs. Any of the bromides may be used. The dose should be rather small at first, and increased gradually until a sufficient dose is taken to control the attacks. The dose to commence with may be from ten to twenty-five grains in one-half glass of water from two to four times per day. It may be increased by degrees to almost any amount. In a few cases the use of this drug seems absolutely necessary. It is, I am sure, rarely curative and is frequently harmful. Bromism may occur, when the drug must be stopped for a time. Then commence again with the same dose. I prefer, when I am compelled to use it at all, the strontium bromide. I usually commence with five-grain doses four times per day, each dose in one-half glass of water, I increase, five grains at a time, to fifty- or sixty-grain doses sometimes. I have never had to give more than this of the salt.

There are no other antispasmodics that need be mentioned or considered. There are several anti-epileptic remedies on the market, from the use of which reliable cures have been reported. Their failures though are legion.

The opium treatment is not successful. Oenanthe has of late been brought into prominence, but I can as yet give no opinion in regard to it.

For the status epilepticus, and to control severe attacks occurring in cerebral lesions, it may be necessary to use some powerful drug for a short time. I have used many modifications of this prescription:

Sodium bromide, grs. 960.
 Chlorate hydrate, grs. 320.
 Hyoscyamine hydrobromate, grs. $\frac{1}{2}$.
 Aqua distil, q. s. ℥viii .
 Mx.

Sig. Teaspoonful in water every hour or two till the attacks cease.

The hypodermic use of the $\frac{1}{100}$ of a grain of the hydrobromate of hyoscyamine may occasionally arrest a spasm or a series of them.

Atropia with the hydrobromate $\frac{1}{100}$ gr. of each may be used with caution.

Chloroform administered slowly and continuously, may control a series of attacks or arrest a convulsion at the onset.

Amyl nitrite in pearls or on a handkerchief has seemed to prevent a convulsion in many cases. It should be held under the nose at the first signs of an approaching attack. There are so comparatively few cases in which it is possible to apply this preventive, that it is rendered of comparatively little practical value.

As a rule the best treatment for the attack itself is to see that the patient is protected from harming himself and let alone until the

attack is over. It is not advisable to waken them from the sleep which follows.

In the treatment of epileptoid the entire attention should be given to effect a cure of the cause. So much has been said in relation to the eye that it seems necessary to give this reflex some special attention. Many brilliant cures of long-standing cases have followed operations on the eye, and also a correct fitting of glasses. The claims made by various neurologists and oculists that a very large majority of the cases can be cured through the eye, are I am sure the result of enthusiasm. On the other hand a very careful examination of the eye must always be made, not only for manifest, but for latent trouble. Glasses, where they will correct the defect, must be worn constantly. There are a number of cases in which there is ciliary spasm; in these it may require a number of fittings and changes of lens to correct the defect. In some of the muscular insufficiencies in which operative interference is not advisable it may be necessary to develop the muscles by a series of exercises with prisms, and to change the lens from time to time. In very many muscular troubles, after the first fitting a much larger degree of heterophoria will develop, and need new corrections. The operative measure may be either one complete tenotomy, incomplete tenotomy or a series of gradation tenotomies. If the cause is in the eyes, improvement will not appear until there is correction. It is not at all infrequent to have marked aggravation immediately after the correct fitting, and it is almost sure to occur if improperly fitted. In case of correct fitting, the aggravation is for only a short period. Any and every defect in the eye must always be corrected. There are a very large number of cases cured in this way.

The ears, nose and throat must also be closely scrutinized. The genitals and the rectum need attention very frequently. A clitoris, a prepuce, or a cicatricial plug may be the sole cause, and its removal result in a marvelous cure. The normal ovariectomy is never to be considered. If the ovaries are diseased, it may be necessary to remove them. The digestive apparatus must always receive due attention. The twenty-four hours' urine here will often also tell the story, and the correction of it produce a cure. Every possible source of reflex irritation must be removed if possible. Following the removal of the cause the general directions for the curative treatment of epilepsy should be carried out for a time.

In the *Jacksonian* epilepsy operative interference should always be carefully considered. If there is a reasonable supposition that the lesion is of such a nature that removal is possible, an operation is demanded.

In all cases of Jacksonian epilepsy skiagraphs of the head should be procured. There should be a set of three, one of the back, one of the side of the brain in which the lesion must be located and one of the front. The fluoroscope will not answer the purpose in these cases. In any case in which there is a particularly dark shadow in the picture it is advisable to make an exploratory opening into the skull at that point.

If the skiagraph shows depressed or fractured bone, an operation is demanded. Finally in any case where there are decided localizing symptoms it may be advisable to explore through an opening into the cranium. There are a few cases reported in which the removal of a small area of the motor cortex, even when apparently normal, has been followed by a cure. In several cases I have found nothing but an unusually thick skull at this point and a thickened membrane. The membrane was cut in the form of a cross, loosely stitched together, and the bone replaced; a cure was the result in part of these cases. Without operative interference there is nothing that offers anything except the use of the bromides.

In many cases, more especially in children, where there seemed to be decided evidence of stomach trouble and a possibility of worms, or positive evidence of stomach worms, I have had most brilliant results from the administration of pepsin. I give the scale pepsin five grains in a capsule, one capsule every two hours for two weeks. I have given this to children not over two years of age. General official work is to be recommended in some of the epileptoids, hysteria and other functional nervous troubles.

Infantile Eclampsia. The very first element of treatment is a perfect calmness on the part of the physician. It is not often that the physician sees the case during an attack, but if he does he should, the instant he enters the room, place the child under close observation, with as little demonstration as possible. He should watch every look and motion of the patient every instant. He will turn his attention seemingly to directing those about the child. The essential element is to treat those about, and by so doing restore, or produce, a quiet, calm atmosphere about the patient. Everyone must be set to doing something. One may be sent after a tub, another to procure hot water, still another to find mustard, and another to get sheets or clothes, and another may be directed to help in undressing the child. This will usually permit the child to recover from the spasm. If the convulsion does still persist, the child may be placed in a hot bath; caution being observed to see that there is no scalding. The hot bath will usually relax very promptly; if it does not within 3 to 5 minutes the

patient should be taken out and wrapped closely in a flannel blanket, laid on a bed or table and chloroform administered. After the attack is over, the doctor will make careful inquiry as to the diet, what the child may have eaten within a few hours or during the day. He should also examine for dental or other irritation. If he finds evidence pointing to disturbance of the stomach or bowels, either an emetic or a full high enema should be administered at once. The results of either of these are sometimes surprising. The gums may be lanced, a button removed from the nasal passages, a circumcision performed, or many other things. If there is no evidence of any irritant, and no history of poisoning, perfect quiet and a sedative, if needed, must be ordered. *Coffea cruda* (3x), *Camphor mono bromate* (1x trit.), are probably the best.

Gelsemium (3x), *Cimicifuga* (3x), *Veratrum viride* (3x), *Belladonna* (3x), *Aconite* (3x), *Nux vom.* (3x trit.), *Opium* (6x trit.), *Calcaria carb.* (30x trit.) are the remedies likely to be called for.

It is quite a habit of mine to give *calcaria carb.* (30x trit.) after the child is apparently perfectly well for a month or two. Whether this is of any value as a preventive of other attacks I cannot say.

LOCALIZED MUSCULAR SPASM.

Facial Spasm.— This form of spasm is quite frequent. It may result from any disease irritating the trigeminal. It is quite common in connection with tic douloureux. It is quite probable that it may also be due to reflex irritation, or to emotional causes. It is not at all common to have spasm confined to this region from organic cerebral lesion.

It is as a rule unilateral and affects the entire distribution of the nerve. The orbicularis oris, the digastric and the stylohyoid are often not affected. It may be confined to a single muscle. The orbicularis oris is one that is at times affected alone; it is usually bilateral. It is most frequently a clonic spasm. There is in some instances a contracture combined with it. The spasms are likely to occur in paroxysms. They may be so slight as to be scarcely noticeable, or they may be quite severe. They are usually aggravated by emotional disturbance or any irritation of the surface. It is nearly always ameliorated by rest, mental and physical. Some patients are able to control the spasm to a great extent through the will. Voluntary motion is not often interfered with. A large portion of the cases, occur in conjunction with, or in the course of some other nervous disorder.

The prognosis is not very favorable. It is likely to continue many years. There are nearly always longer or shorter periods of freedom. The prognosis, however, must depend in a great measure on the possibility of finding and removing the cause.

The treatment must first be directed to finding and removing the cause. Here again the dentist may be a valuable adjunct. The various sources of reflex irritation must not be overlooked.

In cases where the source of irritation cannot be found, or its removal effected, operation on the nerve may be advisable. Simple section will be of no value; a resection of a considerable portion has given entire relief in many cases. In some of the cases the good results were only temporary. There was, of course, a paralysis at first, motion returning after a time and then a recurrence of the spasm. It is possible that cocaine installations may prove beneficial.

The galvanic current has been tried but with indifferent results. Other forms of electricity have not, in my hands, been of any avail.

I have had good results follow, prescribing by the method of fitting the remedy to the patient. Strychnia sulph. $\frac{1}{8}$ gr. four times per day has been followed by prompt and permanent results in quite a number of these cases.

Masticatory Spasm. — This may occur as a clonic or a tonic spasm. If tonic (trismus) the jaws are closed, and the temporal and masseter muscles will be hard and rigid. This is most commonly found in conjunction with some organic disease. It may be the result of irritation from the teeth, especially the wisdom teeth, from periostitis of the maxillary, or inflammation at the joint, also from wounds or inflammation in the mucous membrane of the cheek. It may appear as a symptom in hysteria.

If the spasm is clonic, it will cause rhythmic motions of the jaws. It is very rare except as a result of other disease. It is occasionally found in children and old people. It is sometimes noticed during sleep. It will cause a chattering of the teeth much like that of a hard chill. If not the result of an organic disease, the patient will recover in a few weeks or months. General debility and emaciation may occur in trismus on account of the inability to get sufficient nourishment. The producing cause must be treated. If necessary, narcosis must be produced in order to get at the seat of the trouble. The surgical treatment indicated must of course be emphasized. The hysterical cases will be relieved by the same means as the other symptoms of that disease.

Spasms of the Hypoglossal Region. — Spasms of the tongue often occur in epilepsy, hysteria and chorea. I have seen only two cases in which spasm of the tongue was the only symptom present, both of them in women; in each case the cause was sexual. Others have seen cases from other causes. The spasm may be tonic or clonic. They are intermittent as a rule. Attacks may recur many times a day. Unless from epilepsy or an incurable chorea, they always recover.

There will, in every case, I believe, be a reflex source of irritation the removal of which will cure.

Spasms of the Muscles of the Neck.—The muscles supplied by the accessorius nerve are most commonly affected: the sternocleidomastoid alone or with the trapezius or the splenius on one or both sides. It may extend to the scalini and deep cervical muscles. It will be noted that any combination of the neck muscles may be affected by spasm. The spasm is quite likely to commence in one muscle and then affect others.

The neuropathic temperament is present in a very large number of these cases. Very many of the patients affected with this trouble show marks of degeneracy. In a large proportion of the cases of torticollis no immediate cause can be assigned. Dissipation, especially alcoholic, has often been noted in the history. Sexual irregularities have preceded the torticollis in a few cases. Traumatism may be a cause but not frequently. Occupation may have some influence in the causation. I have seen several cases in draftsmen. It is possible that holding the head in a peculiar position too much of the time may have had some influence. Spasms of the muscles of the neck often accompany organic cerebral diseases.

Symptoms.—The spasm may be tonic, clonic or a mixture of both. In many cases there is a tendency for the spasm to draw the head out of position somewhat slowly, then hold it in this unnatural position a longer or shorter time, when relaxation takes place rather suddenly and the head quickly assumes a natural position again. Nearly always slight pressure at some point, the pulling of a lock of hair, or some other trivial thing will arrest the spasm and cause relaxation. There are many cases in which this is not true, however. There may be a constant, steady, continuous contracture lasting a long time. Quite frequently the attacks are paroxysmal. There will be a series of them at very frequent intervals, and then perfect freedom or nearly so for a few hours or even weeks. A paroxysm of this kind may last only a few hours in a day or it may last weeks. In some cases the spasm is continuous for years. A form known as the nodding spasm is usually combined with nystagmus. Emotional disturbance nearly always acts as an aggravant. The spasm only occasionally lasts during sleep. Pain cannot be claimed as a symptom of this disease, although a drawing sensation and sometimes a muscular cramp pain may be present. In a few cases an alternating of spasm and mental disturbance has been noted. In others confusion of the mind and slight hallucinations have been noticed with the spasms.

The *prognosis* is not very good. A large number of the cases are

no doubt, due to central irritation, the exact nature of which has not been determined. If accompanied by hysterical symptoms the chances for recovery are very good. Cases occurring in young children usually, though not always, recover entirely. In some cases the torticollis seems to be replaced by epilepsy. This condition may last many years. It is likely to increase in intensity to some certain point and then remain stationary, or there will be a series of ameliorations and exacerbations. An apparently spontaneous cure sometimes occurs.

Treatment.—If a cause can be found, it must be treated. It is of the greatest importance that the patient be kept free from excitement. His life should be on the quiet order and very regular. If a light occupation free from the necessity of holding the head in an unnatural position can be found, it is better than being idle. Travel for diversion in an easy manner is good. A long ocean voyage has cured some cases. Hydrotherapeutic treatment helps many cases, and seems to cure a reasonable number. Electricity is recommended by most authorities, but in my hands it has been a failure. I have tried it faithfully in every form. It being a failure in my hands may be simply a lack of skill in its application to this disease, as others seem to obtain good results. Massage does not seem to be useful. So far as I know drugs are of very little use. The bromides in from ten- to thirty-grain doses in a half glass of water given three or four times a day, may be helpful. The opium treatment should never be advised. *Curare* in the ordinary dosage has the credit of some cures. *Hyoscyamine hydrobromate* $\frac{1}{16}$ or $\frac{1}{8}$ gr. hypodermatically two or three times a day, for a period of several weeks has resulted in cures. *Duboisine* in the same dosage has cured other cases. In using either of these two latter drugs, there may be some mental symptoms of a transitory nature. Operation is in some cases successful. Dr. Anderson in his hospital work got some very good results from the use of the knife. On the whole, however, the operative treatment has been disappointing. It should, however, be resorted to in case all other means fail.

I place the greatest reliance on forcible extension of the affected muscles. In cases in which the head is tipped backward, the frequent hanging is probably the best method to use. It is my custom to hang the patient as described in *Tabes*, three or four times a day. I gradually increase the length of time of suspension of the patient, till he actually hangs from the head, with only slight support from the arm pits, a full half hour at each time. If the head is drawn in other directions, as it may be, it is better to fit some kind of a harness that will absolutely prevent the malposition, and will at the same time place the spasmodic muscles on a slight stretch. It will frequently require

many efforts and the use of the greatest ingenuity to devise and adapt this harness. Each case must be individualized, therefore it is impossible to give any general form of harness. It should at first be worn only for a few minutes; the time of wearing must be increased by degrees until it occupies the entire waking hours. A pulley weight with a loop to adjust over the head may be of the greatest service. The patient should sit so that the weight will keep the head in a natural position, for an increasing length of time every day. He may finally spend the most of his waking hours in this way. He can often read or even write while undergoing this treatment. I am sure the mechanical extension treatment is by far the most useful, and produces a much greater percentage of cures than all others combined. It must be persisted in for weeks, and it may be for months. Improvement from week to week is not to be expected, only from month to month.

Spasms of the muscles of the trunk and extremities may occur, but do not seem to need special attention, other than the application of the principles suggested for other local spasms. These must of course be modified according to special location and the character of the spasm. In general, local muscular spasms, when an adequate cause cannot be found, do not offer a very hopeful prognosis.

IMPULSIVE SPASMS OR TICS.

This is variously named: *General Tic*, *Maladie des Tics Convulsifs* and *Myospasia Impulsive*. This is a very rare disease. It occurs as a rule between the ages of seven and fifteen. It has as a primary cause, the neuropathic heredity probably in every case. A sudden emotional shock or a trauma may be the immediate cause. This disease usually commences with twitching of the various muscles of the face, eyes and mouth. These cause more or less facial distortion.

At a later time there will appear a twitching of the muscles of the neck, and possibly still later of other muscles. These twitchings sometimes appear as though volitional. It is practically a constant repetition of the same identical short, sharp, twitching movements and in the same order. The fact that they are without purpose, will always soon be established. In the early stage they may be confounded with chorea, but the characteristics above mentioned will suffice to make a differentiation. The disease appears in paroxysms. The patient is perfectly conscious of them, but is unable to control the movements. The *prognosis* as suggested by various authors is conflicting. The most successful treatment so far used is, as nearly as possible, complete isolation of the patient, and hydrotherapeutic measures. Hypnotism has seemed to be of curative value in these cases.

MYOCLONIA OR POLYCLONIA (or, according to Friedrich), PARAMYOCLONUS MULTIPLEX.

This form of spasm appears only in the neurotic. The immediate cause may be trauma, emotional shock, or it may follow some infectious disease. It is a series of clonic muscular contractions. They are without rhyme or rhythm. Very short, lightning-like. These spasms may affect only a single muscle, a group of muscles, or may affect several widely separated groups at once. This may be a hysterical phenomenon. It is in some instances undoubtedly a distinct entity of itself. In these latter cases the prognosis is very doubtful.

The thyroid gland treatment has been successful in these cases. Fowler's solution of arsenic in increasing doses has been of value. The hydrotherapeutic treatment should always be tried.

For all the different varieties of spasm the prescribing should be by the method of prescribing for the patient. It is impossible to affiliate a remedy to any special spasm.

OCCUPATION NEUROSES.

There occurs quite frequently localized spasms, loss of co-ordinate control, or paralysis in certain sets of muscles for a specially complicated co-ordinate action due to the too constant use in this particular manner. There are a large number of occupations in which this is especially liable to occur. A partial list may be given. The horn-blowers, the violinists, the celloists, the flutists, the pianists, the seamstresses, the cobblers, the tailors, the dancers, the cigarmakers, the watchmakers, the typewriters, and a host of others.

The form known as *Scriveners' palsy*, or *writers' cramp*, is probably the most common. The consideration of it will answer for all. The same principle applies to all. The etiological factor is essentially the same in all. The pathology, when it is known, will be the same in all. The same principles must be recognized in the treatment of all. The only modifications being such as are naturally suggested by the difference in occupation.

The muscles implicated may be, and usually are, under perfect control for all purposes except the one that has caused the disease, and are irregular or impossible for that one.

In writers' cramp the cause is a too long-continued, regular use of the pen, used in the same manner in writing. This could be obviated if everyone who is constantly engaged in writing, drawing or figuring, would be careful to frequently change the method of holding the pen.

I believe this disease occurs only in the neuropathic temperament.

It is a condition in which the patient, on account of loss of power of the muscles, is unable to hold the pen, and it drops out of the fingers; or he is unable to make legible characters, on account of spasmodic movements in those muscles. The finger movement in writing is particularly likely to produce this disease. Writers should use an arm movement. It would seem that anything that tends to general prostration or malnutrition, causes an additional predisposition. Long continued emotion of any kind, seems to be a factor in making a person liable to these diseases.

There may be nothing but a tremor. A neuralgic or painful form is observed at times, although in many cases there is no pain. In the neuralgic form, the instant an attempt is made to form the ordinary combination of movements in writing, a pain of some character occurs. There are no other symptoms that can be claimed as belonging to this disease.

Where there is tenderness on pressure, sensitive pressure spots, or symptoms of other parts, they are not due to the writers' cramp. It is true that the disease may occur while the patient is affected with some other malady. The diagnosis is to be made on the special peculiar symptoms. There may be some danger of confounding a slight neuritis or a neuralgia with writers' palsy, but the presence of any symptom, aside from the one kind of loss of control, or pain only when the hand is in the one position, will enable an absolute diagnosis to be made.

At this time there are no reliable data concerning anatomical changes. It seems quite probable that in many cases at least, there is a molecular change in the brain center.

Treatment.—The usual occupation must be stopped, so far as that set of muscles is concerned. The patient may have to write with the other hand, but will be almost certain to have an attack in it also, after a time. Absolute stopping of all writing is by far the best rule, and should be advised whenever it is possible for the patient to do so. If writing cannot be stopped, a much larger penholder should be used a part or all of the time, or the holder may be thrust through a cork, and held by it. A lead pencil may be used in place of a pen. The principle is in the change in the position of the fingers in holding and using the pen.

The different devices for the accomplishment of this purpose are without number. Many mechanical devices have been invented, and used with varying results. If the case is well advanced, none of them will be of permanent utility. In recent cases any of them may be curative.

The *prognosis* is not very favorable. Still a great many cases are cured. Hydrotherapy may be of some benefit. Electricity is not often, if ever, indicated. Massage steadily, persistently and regularly to the affected muscles, using deep kneading, has proved to be a very valuable remedy in all occupation neuroses. Gymnastics in the form of rhythmic, regular movements of the member affected will be of value. Cases are reported as cured by regular daily sawing of wood, also chopping wood. A change in the occupation that will give the affected member an entirely new motion will very often, in the course of three to five years, produce a cure. Nerve stretching has resulted in cures in some instances. So far as I know I first suggested this method of treatment for writers' cramp. I am not at all satisfied that it was a wise suggestion.

TETANY.

This is a rare disease in this country, but is occasionally met. It sometimes occurs in an epidemic form in certain places. Women are more likely to be attacked than men. It is more common in younger people and children.

It is probably always either toxemic or infectious. It rarely occurs in children unless they are affected with a marked tendency to stomach and bowel trouble. Shoemakers and tailors seem to be especially subject to this form of spasm, not on account of the character of their work, but from poison in the material they use. The thyroid gland seems to have a decided influence over the disease. Its entire removal predisposes to it. It also seems that excessive secretion from this gland is sometimes the cause of tetany. It has sometimes followed the use of the stomach pump or the passing of the urethral sounds.

In some cases it has seemed to be the result of reflex irritation. A condition resembling it rather closely occurs occasionally as a hysterical phenomenon.

Symptoms. — At the first, there is usually some general headache not specially characteristic. Some general disturbances and malaise. There is likely to be paresthesias and considerable pain, particularly in the upper extremities. There now appears a tonic, painful intermittent spasm. This is confined to one group of muscles and nearly always in the upper extremities and bilateral. The small muscles of the hand are usually first attacked. There is a peculiar deformity present when this is the case, that is almost diagnostic. The fingers are markedly flexed on the hand, but the fingers themselves are rigidly extended. That is, with the fingers unbent they form nearly a right angle with the hand. The fingers are likely to be drawn together or possibly slightly overlap each other.

There are many cases in which the hand and fingers assume very different positions. It may be almost any position that contractions of the various groups of muscles singly can produce. The hand may be flexed on the wrist and there may be also flexion of the elbow. It is very uncommon to have the muscles of the trunk affected. They may be in a very severe case. If, as occasionally happens, the lower extremities are affected either alone or in conjunction with the upper, the contractions will be of the same general character and of the same relative muscles. In very severe cases there may be nystagmus and affection of the ciliary muscles. Trousseau's sign never occurs in any other affection, its absence does not mean, however, that tetany is not present. The sign is that "pressure on the affected limb will cause an attack."

In most cases an attack can be produced during the intervals by pressing in the region of the internal bicipital sulcus for from half a minute to three or four minutes.

The contractions may follow each other in rapid succession, so as to be almost continuous or at long intervals. Each one may last a few minutes only or it may last hours or from eight to ten days. They may occur daily for a time, with then an intermission of days, weeks or months, or there may be days, weeks or months between attacks.

The pulse will nearly always be a little rapid. The temperature may be slightly raised or subnormal. There is increased mechanical excitability of the motor nerves. There will also be increased electrical excitability of the motor nerves. The reflexes may be increased, decreased or normal.

The prognosis as to life is good. The disease is quite liable to relapses at varying periods. Many cases run irregularly through many years. In the majority entire recovery is to be expected. If there is dilatation of the stomach, or the thyroid has been resected in its entirety the chances of recovery are not nearly so good. If the respiratory muscles are implicated, there may be a fatal ending.

Treatment. — The cause producing it must receive attention. The digestive apparatus must be put in as perfect order as possible. Eliminating baths are often of the greatest value. The twenty-four hours' urine, as always, must be analyzed. In this disease the urine may be an important factor. Possible sources of reflex irritation must be looked for, and, if found, receive due attention.

Severe cases may require the bromides or the hypodermatic use of hyoscyamine $\frac{1}{160}$ grain. Curare is also recommended for arresting the immediate spasm. The spinal ice-bag may be of value. The thyroid is so important a factor in this disease that it must receive special attention. Whenever it becomes necessary for any pur-

pose to remove this gland, the surgeon should leave as large a portion of it as possible. The use of the thyroid internally is always to be considered. Dr. Stillman Bailey uses this remedy in potentized form in some cases.

It ought, and I believe will be, valuable here in the 3x to 6x. The general directions for this remedy as found under exophthalmic goiter will be the guide for its use in this disease. The indications for the various remedies will be found in the collateral conditions.

CHOREA.

Synonym. — St. Vitus' Dance.

This is a disease or more accurately a condition in which there is varying irregular muscular contractions of any part (or all) of the body. These contractions may cause only slight twitching or they may cause involuntary movements, of almost any kind of any part of the body. These twitchings or movements are very light, or so severe as to prevent a patient from walking, sitting on a chair or even lying in bed. There are several forms of disease that come under the head of chorea.

Etiology. — The great factor is either a congenital or acquired neuropathic temperament. Anything that tends to general depression may cause a predisposition to this disease. Bad feeding, unsanitary surroundings in general, wasting or debilitating diseases are all predisposers of chorea. There cannot, except in one form, be a direct heredity, but there are in many cases decided hereditary influences, such as dissipation, insanity, epilepsy, and various other nervous troubles in the direct family line. It not infrequently follows attacks of acute sickness. It is of frequent occurrence in anemia. No age is exempt, but it is very much more common after the fourth, and before the twentieth year. It occurs much more frequently in females than in males. This disease is very frequently the result of imitation and sometimes of habit. A susceptible child sees a person affected with this disease, or with some form of spasmodic affection, and immediately or very soon develops a chorea. Emotional disturbance of any character may cause it, especially great excitement. This cause is a very prominent factor in adults. The changes and conditions of puberty often seem to be the direct cause. In many cases a delay in the appearance of the first menstruation, or subsequent irregularity often results in chorea. A great many cases appear during the first five months of pregnancy. They occasionally appear later during gestation. In these cases the chorea always disappears with the delivery whether it be at full term or before. Very few cases occur except with the first pregnancies. Rheumatic

fever and inflammatory rheumatism are quite often complicated with chorea. Endocarditis is an undoubted cause. An autoinfection of some kind may be the producing cause.

Reflex irritations of various kinds are very prominent etiological factors. A very large percentage of the patients have hyperopia. There can be no question that eye strain may be a direct cause of chorea. Irritation in the nasal passages, adenoid growth, dental or ear trouble may any of them cause it. Malformations of the prepuce, or clitoris, are often the source of trouble.

Digestive irritation without question is a frequent cause. Hysteria is closely allied to this disease. There may be a hysterical chorea, or a choreic hysteria. It occasionally appears in epileptics.

Symptoms.—The disease comes on very slowly. At the first there is simply a little unusual awkwardness in some way. An unusual bodily restlessness. It is attributed to carelessness and awkwardness. This condition simply increases until it is observed that there is a tendency to sudden motions of some kind, a twitching of the muscles of the face. That there are motions that evidently cannot be controlled. The patient cannot sit or stand still, there is constant irregular motion, it may be of one or both hands, or of the feet. These movements may be simply in the form of shrugging the shoulders, opening and closing the fingers, or almost any other form. There is no rhythm unless the manifestation, as is occasionally the case, is confined to one part; there will be a movement, now here, now there, in one part, then another. It is not a spasm; it is more nearly like a voluntary movement, but purposeless. The upper extremities are more frequently affected. The tongue is often affected so it cannot be protruded at all regularly. Speech may be interfered with to any extent, from a slight jerky utterance to an inability to utter a word. The respiratory muscles are usually affected. The involuntary movements of the muscles of the mouth, throat and palate may materially interfere with eating. The ocular muscles may be implicated, but those of phonation almost never.

A slight increase in temperature is frequent, and in severe cases there may be a very high temperature.

Diagnosis.—In the majority of cases there is no difficulty presented, except that of determining the cause. The diagnosis is not complete until this is done. The absence of paralysis, and the presence of involuntary motions not in the form of spasm, and the absence of rigidity or contractions, will differentiate chorea from any disease for which it could possibly be mistaken.

Prognosis.—In general it is safe to expect a cure in about three months. A great many cases with or without treatment will limit

themselves and disappear in three months. A certain portion of the cases will last six months or a year. A few will last much longer, even for many years. Marked heart symptoms should demand a very close heart examination and if evidence of endocarditis or of a fatty heart, or of a mitral insufficiency is found, the prognosis is not so favorable; death ensues in a great many cases of this character.

If there is rapid emaciation, loss of strength and a markedly increased temperature, the prognosis is more serious.

The choreas of pregnancy are always serious, not that many of them prove fatal, but the pregnant condition with its dangers furnishes the element of seriousness. The chorea will almost invariably stop as soon as the uterus is emptied, but premature labor has elements of danger. If this does not come on or is not produced, there is serious danger from exhaustion caused by the constant muscular movements. There is frequently a tendency to reappearance.

The possibility of the removal of the cause may modify the prognosis.

Treatment. — The first consideration is the cause and its removal or correction. The correction of the eye defects has cured a large number of cases almost immediately. If the lenses are not properly fitted not only do they fail to cure, but are quite likely to aggravate. Every possible source of irritation must be relieved. Every cause must be treated and cured.

The next important step is to secure perfect nutrition, and good hygienic surrounding. Special care and attention must always be given every case in these matters. There must be as much freedom from excitement of any kind as possible. There should be a full amount of very moderate outdoor open-air exercise. Except in the mildest cases there should be isolation from companions, friends and even in a measure from the immediate family. It is important in the management that the patient have something to occupy his or her attention. It must not be anything that is exciting or taxing. If the case is a severe one, the patient must be kept quiet in bed. If severe enough to require it, there must either be a restraining sheet to prevent the patient from injury by striking against the wall or parts of the bed or falling on the floor. It will at times require two attendants on each side of the bed to protect the patient. Scolding or any effort to compel the child to keep quiet will only aggravate; it can do no good. It may in very severe cases be necessary to give bromides or some other hypnotic to produce sleep and give the patient needed rest. In a very severe case it may be necessary to keep the patient practically under the influence

of chloroform for an hour or two at various times during the day and night.

Arsenic is the great remedy for this disease, with the regular school. It is also recommended in the same dosage by some homœopathic authors. I have had its use apparently necessary in a few cases, and have had no reason to regret having prescribed it. In a child under ten years of age give four drops of Fowler's solution four times per day, gradually increasing the dose to eight to ten drops. On the appearance of stomach or skin trouble, it should at once be stopped, to be used again if necessary after a few days. In older persons you may commence with six or eight drops. I have used more frequently the *Ferrum arsenicosum* (1x trit.) commencing with one grain and increasing as necessary.

Ignatia (30.) is to be used for the ordinary indications.

Strychnia (3x to 30.) is an excellent remedy in many paralytic cases where the chorea is in the paralyzed parts.

Strychnia phos. (3x trit.) may be indicated when there is a tendency to prostration with anemia.

Cuprum acet. (3x). The movements appear to start in the fingers and spread up the arms. While often not entirely absent during sleep, the movements are much less. The muscles of the throat are implicated. *Cimicifuga* (ø or 30.). This remedy should always be considered in the choreas appearing at about puberty, and where there seems to be a delay in the establishment of the menstrual function. It is also indicated in all those cases where there is a tendency to the appearance or aggravation of the chorea at the menstrual period. If there is melancholia and a wearing pain under the left breast. *Scutellaria lat.* (1x trit.) has very much the same general characteristics as *Cimicifuga*, but instead of melancholy it is the opposite.

Gelsemium (30.) is a remedy that is indicated in a great many cases. The indications for this drug are so familiar that it is not necessary to give them here. Dr. Hale suggests five-drop doses of the green tincture, and gets some excellent results. *Hyoscyamine hydrobromate* (Merck's) (4x trit.) a two-grain powder once in four hours has frequently controlled the movements temporarily, and in some cases held them under control. Where I find *hyoscyamus* indicated, I have frequently used this preparation, and alternated the 4x with the 30x trit. with the very best of curative results. *Agaricus mus.* will often be found to be a very close similimum. *Causticum* (3x and 30.) where indicated, I think I have had much better results by alternating the high and low than from either one alone. There are many other remedies that will be found indicated by the various causes. In the rheumatic cases, for

instance, the remedy will be selected according to the indications of that trouble, so in many others.

In the chorea of pregnancy unless it can be controlled very promptly by ordinary means, delivery of the fetus should be made at once. There should be no hesitancy about this.

HEREDITARY CHOREA.

Synonyms. — Huntington's Disease, Chronic Progressive Chorea.

This is a disease that is directly hereditary. It passes on from parent to child, from generation to generation. Occasionally, one in the line may be afflicted with insanity, dipsomania or epilepsy, seemingly instead of this, the children being still attacked with this form of chorea. If by any chance a member of the family is spared, the line is broken, and the descendants are free.

It does not usually appear until the patient is thirty or forty years of age. In some cases it has occurred earlier or later. There will be very slight choreic motions appearing at first as a rule in the face and upper extremities. These gradually grow more marked and extend to other parts of the body until every voluntary muscle in the body is affected. The ocular muscles are very often free. Mental excitement and emotional disturbance always aggravates the motions. The use of strong will force will, in a measure, control the motions for a time.

The patient is able to walk, but with a very peculiar gait, until the disease is far advanced. The gait may be with a movement similar to dancing. It will be very erratic and irregular. The body may be bent forward.

The strength of the muscles is rarely diminished until very late in the course of the disease. There are, as a rule, no symptoms of either the special or general senses. The deep reflexes are usually slightly decreased.

There is nearly always mental weakness, suicide is not very rare. It is the result of mental depression.

The *prognosis* is simply bad. No case has ever been cured.

The *treatment* must be sedative. The same line as suggested for the tremor in multiple sclerosis is applicable.

PARALYSIS AGITANS.

Synonyms. — Shaking or Trembling Palsy, Parkinson's Disease.

This is essentially a disease of later life. Occasionally a case will be found previous to the fortieth year.

The *etiology* is shrouded in mystery. Many causes have been assigned, but none so far seem to be established even tentatively. It

is not seemingly essential that the neuropathic temperament be present. Traumatism in which the nerves are crushed seems to have been the cause in a very few cases; that is the symptoms appear within a reasonable time after, and first in the injured member. In my own experience I have yet to meet the first case in which there had not been a long-continued worry. Syphilis is not a cause.

Symptoms.—The patient may be perfectly healthy, strong and robust. There comes a slight feeling of malaise; that is, they do not feel quite the energy and force of previous years. Often these symptoms do not appear until much later. The patient is sitting idly, a hand resting on the knee or table. It commences to tremble a little; it is moved, the trembling ceases. This occurs time after time. It is after a time noticed that whenever the hand is at rest, it trembles. The tremor may not commence in the hand, but this is the most frequent onset. It may begin in a foot or a leg or in an arm. The tremor is rhythmical, it is small, about four to eight per minute. It is always relieved by motion; never present except when the part is at rest.

This tremor gradually and very slowly extends from its initial point along the member first involved until that entire member is affected; previous to this the opposite member, the other member on the same or the opposite side has been attacked. The tremor spreads in this manner until after some years the entire body below the head is affected with the tremor. A peculiar movement of the thumb and fingers as if the patient were rolling pills, is usually present. There may be periods of remission. The movement is practically the same from the beginning to the end, and in every case, the tremor is increased by mental excitement. Emotional influences of any kind are likely to exaggerate it. The tremor usually stops during sleep, but is quite apt to prevent sleep for some time. There are occasional cases in which the lower jaw is affected.

The next symptom of importance is muscular rigidity. Occasionally there will be present a case in which there is no tremor, and this rigidity comprises the entire symptomatology. This rigidity involves the muscles of the neck, the nape of the neck and the spinal column mainly. This appears at varying periods after the onset of the tremor. This rigidity causes a peculiar position of the body. The head and trunk are inclined slightly forward as if in the act of bowing. The elbows are held close to the side, the elbows slightly flexed, the hands held on the thighs or a little in front of them, and in a position as if rolling something between the thumb and fingers. There is a peculiar stiffness in the general appearance and a statue-like appearance of the face. The face is immobile and without expression. It is not a flaccid appearance.

The gait is also peculiar, the steps short and shuffling, rather quick. There is a feeling as if he would fall forward. The center of gravity seems to be just a little ahead of him, and he can never quite catch up with it. There are cases in which the tendency may be to a backward or a side movement. He can walk upstairs much easier than he can walk on a level. A patient who finds difficulty in walking on a level may be able to run upstairs.

The speech becomes slow and scanning; that is, a tendency to pronounce with nearly the same emphasis on every syllable.

Late in the case there will be marked resistance to any passive motion.

Paralysis may occur late in the case, but it will be incomplete.

The deep reflexes are always present and are sometimes exaggerated.

The bladder and rectum are not implicated; there are cases in which bladder or bowel trouble is present, but they are simply concomitant and have no relation to the disease except possibly to render the conditions more pitiable.

There are no objective sensory symptoms, but a sense of surface heat is very common.

The mind usually is clear even in the last stage. There is likely to be a slight elevation of temperature and a corresponding increase in the pulse.

There is occasionally a case in which a sudden impulse, as though paralyzed, passes through an arm or leg. Tremor occurs in that part almost immediately.

Paralysis agitans may occur in the paralyzed side of a hemiplegic, but rarely.

The disease progresses exceedingly slowly; there may be periods in which there is no advancement, and of actual remission. The course from year to year, however, is always one of progression.

Prognosis. — It practically never kills and never gets well. The patient will become more and more helpless and suffer to the end.

Diagnosis. — The differentiation from senile tremor ought to present no difficulty. In the senile tremor the peculiar position is never present, nor is the tremor one of rest entirely. The head is affected with the tremor. In this disease it is not.

In a few cases it may be confused with multiple sclerosis. The ophthalmoscope will, however, clear up the differentiation. The tremor of multiple sclerosis appears during motion, while that of paralysis agitans is during rest. Senile arterio-sclerosis may resemble this disease very closely. There will, on careful examination, be found true paralysis.

There is occasionally a case resulting from traumatism in which there will be a line of symptoms that do not belong to the clinical picture of this disease. I consider them as cases of paralysis agitans, however.

Pathology.—Of the pathology nothing definite is known. Various alterations in the brain and cord have been observed, but as yet none that are uniformly present.

Treatment.—There is simply nothing to suggest under this head. Excitement and emotional disturbances must be avoided as far as possible. A quiet life is by far the best. The adjuvant treatments so useful in many other diseases are of no avail in this.

Gelsemium tincture five drops from four to six times per day, may alleviate somewhat. *Norwood's veratrum viride* tincture in three- or four-drop doses, four times per day, may assist in quieting the tremor for a time. *Zinc phosphide* $\frac{1}{4}$ gr. before each meal has seemed to give some relief. *Hyoscyamine hydrobromate* (*Merck's*) (4x trit.) every four hours is also a valuable remedy in quieting the tremor. *Duboisine* may act in the same way in some cases.

In the later stages things must be so arranged that the patient can be gotten out of the chair or out of bed quickly. The patient, for relief and rest, must be helped up and to walk a little at frequent intervals. To raise the patient from the chair take hold of the hands and pull gently to a standing position. In seating again, hold the hands and let him down gently. In this, if caution is not taken, the patient will drop suddenly.

There nearly always comes a time, but it must be deferred as long as possible, when morphine must be used continuously. There is no other way. No physician could stand it to see the unrest and suffering, knowing that it can be relieved, and yet withhold the relief. The precaution necessary is to vary the size of the dose from day to day, one day a larger, another a smaller dose. The hours at which it is given must be varied also from day to day. This avoidance of any semblance of regularity in size of dose and time of administration is of the greatest importance.

PROGRESSIVE FACIAL HEMIATROPHY.

This disease is one of youth. It practically never occurs after the thirteenth year. It may be the result of injury to the face. It has followed acute infectious diseases. It may follow a facial neuralgia.

The skin at certain points on one side of the face begins to get thin, usually over the inferior maxillary or the orbital region. The skin changes in color becoming brown or blue. There will then be

a local infiltration. After this the areola tissue begins to disappear, and the skin lies in folds over the bones. The atrophy may affect the bones, and in rare cases the muscles as well. The muscular atrophy, however, is not a degenerative one. The whole half of the face is smaller than the other side. The eye is sunken. Cases are reported in which the tongue and larynx were involved. It is a progressive disease. It is likely at some stage to arrest itself. It may appear in psychic disorders, or in the course of facial spasms or of epilepsy. This is almost certainly a disease of the sympathetic nerves. No treatment is of any avail.

ACROMEGALY.

This disease begins nearly always between the age of 20 and 40. Traumatism and emotional shocks are the usual causes. There will be enlargement of the hands and feet, especially the fingers and toes. There will also be enlargement of the lower jaw, the lips and nose. The increase in size is in all the tissues, soft and hard. The skin is thickened. There may be increased size of the lower cervical and upper dorsal vertebræ. The clavicles and the sternum also are sometimes found enlarged. The circumference of the head may be increased. The frontal eminence is especially prominent in many cases.

Headache, general dullness, a somnolent tendency and lethargy are always present. There may be some mental disturbances. There are apt to be disturbances in the eyes, such as optic atrophy and neuro retinitis. Polyurea is quite frequent. Diabetes often occurs with it. Lesions of the heart, and marasmus often appear, and may cause a fatal termination or the patient may die from some intercurrent disease. There is no difficulty as to the diagnosis. There is at the present time no treatment known.

HYPOCHONDRIASIS.

Definition and Etiology.—This is a disease quite common in persons of advanced years, but not by any means confined to such. It may be found at any time of life, even in children. It is really a mental disease, although it ought not to be classed as an insanity. To be sure it may be a prominent symptom in certain cases of insanity, or it sometimes is a prodroma to insanity. It is a disease that should demand the utmost attention and skill of the physician. If any physician fails to cure a case of hypochondriasis, he should never fail to call for help, or to turn the patient over to some other thoroughly conscientious, reliable, practical expert in this line.

It may be a natural or inherited tendency, or entirely acquired. In nearly all cases there is present the neuropathic temperament.

Hypochondriasis is a firm belief in being afflicted with disease, for which belief there is no foundation, or a constant tendency to exaggerate sensations and conditions, and to be anxious about them without cause.

This disease rarely comes on without some tangible starting cause. It may be very slight and trivial, but it is sufficient to hang a continued exaggerated mental anxiety upon.

In the judgment of the writer there are two especially prolific causes for this disease. The one, undue anxiety on the part of the parents of children, or later of the wife or husband, which impels them to constantly draw attention to the slightest ailment. The other is the culpable malpractice of many physicians, in making every patient believe the worst possible of every ailment they are called upon to prescribe for, and neglecting to allow the patient to do as much as he may be able or desire to do, on the plea that he must be very cautious.

This cannot but inculcate in the mind of the patient, undue introspection, and wonder at first, as to whether this or that will injure: later a constant worry for fear it will; and still later a certainty that it has and will do great injury to them. The few extra dollars the physician gets by too frequent visits, or by extra visits after the patient should be discharged, is often at fearful cost to the patient by forming a basis for this disease.

Slight irregularities of digestion, or functional disturbances of the liver are frequent causes. The heart often is the foundation. There may be a pain in the heart region or possibly some slight temporary irregularity upon which is built a certainty, and a constant anxiety of fatal heart disease. Some accident, trivial in itself may be the foundation for many anxieties. Starting causes could be mentioned page after page, but I think this sufficient to fully illustrate the idea.

Symptoms.—The symptoms may be of any character, and the patient is constantly dwelling upon them. It is often almost impossible to get them interested in any subject outside of their own ills. Of course this is not the case with all, for in the milder forms they may attend to all their affairs closely and regularly; but in severe cases, they can scarcely think of anything but themselves. They all, mild or severe, take medicine and treatment constantly. There is no cure so nauseating, so severe, so revolting, so absurd, that they may not undergo it. They are apt to change physicians often. They are a bonanza to the quack. The person who will promise the most is the one most likely to get their patronage. They buy patent medicines of all kinds liberally. In fact the hypochondriac is quite likely to become his own physician.

By this I mean he first diagnoses his own case; that is, he knows just what is the matter; and then if he goes to a physician, unless that physician agrees with him, he will not employ him. He is quite apt to tell what medicines agree with him, and what he cannot take. He may not go to a physician at all, but thinks massage or electricity or some other method of treatment is the thing, and goes where he can get it; or he reads advertisements, selects the patent medicine he thinks best, and takes it. He is quite likely to take what his lay friends advise.

Diagnosis.—The diagnosis frequently presents some points of difficulty. The making of a diagnosis is often a very essential element in the treatment. It should never be made without very carefully taking a complete history of the patient in writing, and in chronological order. Then there should be made a complete and very careful physical examination of every organ in the body—everything from the crown of the head to the soles of the feet. Nothing should be overlooked or gone over slightly. The 24-hours' urine should be thoroughly analyzed, and the blood examined. In short, the physician must first satisfy himself absolutely of the impossibility of there being any physical existing cause for the symptoms complained of.

There being no abnormal physical condition, the character of the symptoms as described—the willingness, even urgency, to take treatment (the melancholic has no faith in any kind of treatment doing any good); the absence of insomnia, or at least comparative absence; the absence of the post-cervical ache, which is so common in melancholia; the absence of a decided suicidal tendency; and the absence of the melancholic face, which is so typical—is a sufficient guide to the diagnosis.

Treatment.—The treatment of hypochondriasis is exceedingly difficult. It requires patience, tact and skill of the highest order. Every case must be studied as an individual; no general line can be laid down to be followed in even a large per cent of the cases. There are, however, some general principles that will act as a guide. The first is to emphasize any curable, special physical trouble that may be present, and direct the treatment to it.

There may be refractive errors of vision, or muscular insufficiency, or spasm of the eyes. Correct it at once. There may be a bony spine in the nose, or some other tangible trouble. Remove or correct at once. There may be actual or functional trouble in the digestive tract. Correct it as soon as possible. In this regard, to decide whether to emphasize to the patient the digestive condition, you must consider whether the victim's mind is already centered on this condition; if so, emphasize something else as a cause, but lead him to think lightly of this, or to think of it, as a result, and not as the primary trouble.

You should, however, work faithfully to make the digestion as perfect as possible. There may be some trouble in or about the generative apparatus, or the rectum. If so, it should be corrected at once.

You may find that the urinalysis shows a defective nutrition or elimination; if so, set about its correction at once. In short, direct the patient's attention to some tangible physical ailment or abnormal condition actually present, if any, providing the mind is not already centered on that particular thing. Then undertake to lead the mind into a belief that the correcting of this will certainly cure the entire trouble, using at the same time the best skill available for its correction. If you fail to find any physical condition to which you can connect the symptoms of the patient, other means of diverting the attention must be found. There is here opportunity for the use of large mental resources on the part of the physician, and it may be necessary to try a good many different things, before finding a subject that will actually attract and hold the patient's attention. It may be in the line of amusement, of business or occupation, philanthropy, ambition and pride, in study of some kind, or in travel. Just this moment I have in my mind, getting a very staid, conservative elderly gentleman interested, after many ineffectual attempts in other directions, in a trotting horse, and it worked like a charm.

In younger people, regular physical exercise, is important. A gymnasium is almost always an essential. In older people proper instruction as to breathing, combined with suitable, regular, physical exercise, is a very valuable aid to treatment.

The writer has found in his own experience that much can be done by plain talk along the line of actual facts in the case. Not by saying it is all imagination, or you could stop this if you would, but by placing before the patient, time after time, the fact that there is no physical condition present to account for these symptoms, and that as soon as he can bring himself to a degree of confidence in the physician and believe this fully, he will find his symptoms gradually disappearing. Talk along this line, of bringing the patient to a full realization of the actual condition of affairs, is a most valuable adjunct to treatment.

Suggestive therapeutics, or, as it was formerly termed, hypnotism, has in many cases been of inestimable value. Many cases have been permanently cured by this means. In some cases, arousing emotions of one kind or another, will be found of the greatest advantage. For instance, great anger or great joy may so divert the attention as to work a cure.

The physician who can play on that most wonderful of all instruments, "the human mind," most delicately and successfully, is best adapted to cure this difficult, but always curable disease.

Therapeutics. — There are some remedies that seem to have a direct bearing and influence upon this mental state.

In selecting a remedy, the first element has already been somewhat fully considered, that is, one that will remove or assist in correcting any concomitant present conditions.

The next point in selecting the remedy, is finding one best adapted to the patient; taking into consideration, heredity, general psoric tendencies and predispositions, aggravations, ameliorations, and any special peculiarities of the individual. This is a disease in which the remedy should be selected to fit the patient rather than the symptoms of which he complains.

Calcarea carb. (30. trit.), four to six doses per day. Disposition to weep, with paroxysms of anguish; palpitation of the heart, and rapid changes in the circulation; apprehensions of illness, misfortunes, infectious diseases, insanity, etc., dread of death, aversion to work, inability to think or perform any mental labor.

China off. (3x dil. or trit.), every two to four hours. Mental dullness, or excessive sensitiveness of all the organs of sense; discouragement, fixed idea that he is unhappy and persecuted by enemies; weak digestion with distension of the abdomen; ill humor, indolence after eating; sleeplessness on account of ideas crowding upon his mind; anxious dreams, tormenting the patient even after he wakes.

Natrum phos. Dread and fear of the future; desires to be alone; disposition to vehemence; a number of bodily and mental ailments after a meal, or after the least irregularity.

Nux vom. Fatigue of the mind after the least mental exertion; aggravation of the distress in the morning; aversion to the open air; constant desire to lie down; with great exhaustion after walking; constipation, slow action of the bowels.

Sulphur (30. trit.). From three to six doses per day. Painful anxiety of mind; solicitude on account of his affairs, health, or salvation; absence of mind, irresolute; disposition to feel very unhappy. Anacardium, Aurum, Conium, Gratiola Lachesis, Moschus, Phosphorus, or one of its combinations, and Sepia have, I think, been more frequently indicated in my cases than other remedies, still there is scarcely a remedy that at some time has not been fully indicated.

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